Transportation Concept Report

State Route 99
District 10
May 2017

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California Department of Transportation
Provide a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability.

Approvals:

Dennis T. Agar	5/16/17	Ken Baxter	5/9/17
DENNIS T. AGAR **District 10 Director** **Stockton**	**Date**	**KEN BAXTER** **District 10 Deputy Director** **Planning, Local Assistance, and Environmental**	**Date**

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ABOUT THE TRANSPORTATION CONCEPT REPORT

System Planning is the long-range transportation planning process for the California Department of Transportation (Caltrans). The System Planning process fulfills Caltrans' statutory responsibility as owner/operator of the State Highway System (SHS) (Gov. Code §65086) by evaluating conditions and proposing enhancements to the SHS. Through System Planning, Caltrans focuses on developing an integrated multimodal transportation system that meets Caltrans' goals of safety and health; stewardship and efficiency; sustainability, livability and economy, system performance, and organization excellence.

The System Planning process is primarily composed of four parts: the District System Management Plan (DSMP), the Transportation Concept Report (TCR), the Corridor System Management Plan (CSMP), and the DSMP Project List. The district-wide DSMP is a strategic policy and planning document that focuses on maintaining, operating, managing, and developing the transportation system. The TCR is a planning document that identifies the existing and future route conditions as well as future needs for each route on the SHS. The CSMP is a complex, multi-jurisdictional planning document that identifies future needs within corridors experiencing or expected to experience high levels of congestion. The CSMP serves as a TCR for segments covered by the CSMP. The DSMP Project List is a list of planned and partially programmed transportation projects used to recommend projects for funding. These System Planning products are also intended as resources for stakeholders, the public, and partner, regional, and local agencies.

TCR Purpose

California's State Highway System needs long range planning documents to guide the logical development of transportation systems as required by CA Gov. Code §65086 and as necessitated by the public, stakeholders, and system users. The purpose of the TCR is to evaluate current and projected conditions along the route and communicate the vision for the development of each route in each Caltrans District during a 20-25 year planning horizon. The TCR is developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements and travel demand management components of the corridor.

STAKEHOLDER PARTICIPATION

The State Route (SR) evaluated in this TCR employed an outreach strategy consistent with local Metropolitan Planning Organization (MPO) and Regional Transportation Planning Agency (RTPA) outreach conducted with the development of the Overall Work Program (OWP). This strategy avoids duplicative effort, and reduces public confusion as to the aims of local and regional transportation planning. As the OWP intends to meet federal requirements outlined in 23 Code of Federal Regulations (CFR) 450.314, and in both the Fixing America's Surface Transportation (FAST) Act and the Moving Ahead for Progress in the 21st Century Act (MAP-21), external stakeholder needs can be addressed by local partner outreach efforts related to the OWP. Development of the TCR includes initial outreach to internal partners—these would be Traffic Operations, Traffic Safety, Project Management, Maintenance, Environmental Support, as well as others.

EXECUTIVE SUMMARY

Historically, SR 99 served California as the north to south backbone of the SHS, connecting the four urban centers of the State (San Diego, Los Angeles, Sacramento, and San Francisco), and the State to the Pacific Northwest and Mexico. Originally built as the Golden State Highway in 1910's, and designated as US Highway 99 in the 1920's, portions of the route were relinquished as part of I-5 in the late 1960's. These included sections south from the Grapevine in Kern County to the Mexican border, and of US 99 W north of Sacramento, and both US 99 W and US 99 E north of Redding to the Oregon border. Currently, SR 99 runs the length of the Central Valley from Kern County in the south to Shasta County in the north.

SR 99 is included in the Freeway and Expressway System (FES) and the Interregional Road System (IRRS). The concept Level of Service (LOS) for SR 99 is C for rural segments, and D for urban segments.[1] Most segments do not meet these performance standards, and may require construction of additional mixed use or managed lanes to achieve concept LOS. It was found that a six lane facility south of the 'V' Street (SR 140 West and SR 59 North in the City of Merced) interchange would meet concept, but that a facility of minimally eight lanes would be needed north of the 'V' Street (SR 140 W and SR 59 N) interchange.

Within District 10, SR 99 is freeway for its entire extent, and was broken up into thirty segments for purposes of analysis and evaluation. At this time (the Base Year (BY) of 2016) most of SR 99 is six lanes with the exception of four lane segments in the Cities of Merced, Atwater, and Lodi; the portion of SR 99 in Merced County from Winton Road near Delhi to the Stanislaus County line; and, the portion of SR 99 north of Lodi. Efforts to expand these four lane segments to six lanes on SR 99 are present in local Regional Transportation Plans (RTP) with the exception of the segment north of Lodi. Currently, the eight lane concept is unaddressed in any of the three RTPs[2] with the exception of a portion of Segment 7 in Stanislaus County (STA 7) between SR 132 and SR 219.[3]

Beyond the Horizon Year (HY) of 2040, it is anticipated that one lane in each direction be converted to a high occupancy vehicle (HOV) lane or other managed lanes between the City of Merced and Sacramento County. This improvement might be phased in before 2040, with a segment between SR 165 and SR 120 west having the highest priority, with extension of the lane northwards to SR 4 west as a second stage, and portions north from SR 4 W to the Sacramento County line and south from SR 165 to the City of Merced being last.

Local planning and available funding will constrain the concept facility. Right of way availability along much of SR 99 constrains the facility to a physical maximum of eight mixed use lanes in most urban communities, and makes a facility of greater than eight lanes infeasible, although modeling finds a need for a ten to sixteen lane concept facility between SR 165 (Lander Avenue) and Hammer Lane in northern Stockton. The funding and right of way issues also constrain development of multimodal transportation strategies in the corridor such as light rail or transit only lanes.

Demand management strategies such as ramp metering should be in place for SR 99 by the HY. Priority has been given to the portion of SR 99 in San Joaquin County from Ripon north to Lodi, although numerous planned ramp meters have been identified in Stanislaus County between Mitchell Road and the San Joaquin County line.[4] Currently, above ground facilities for ramp metering are in place on portions of SR 99 in San Joaquin County, with wiring in place at locations in Stanislaus County.

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[1] Caltrans has yet to formulate guidance on employing Vehicle Miles Traveled (VMT) as a performance standard or measure.

[2] San Joaquin Council of Government's RTP and Sustainable Communities Strategy (SJCOG RTP and SCS, 2014), Stanislaus Council of Government's RTP and SCS (Stan COG, 2014), and Merced Council of Area Governments RTP and ACA (MCAG, 2014)

[3] The Stan COG RTP (2014) also identifies four auxiliary lane projects between Fulkerth Road and Keyes Road

[4] Ramp Metering Development Plan (2013), pp 124-131.

Within District 10 three MPO specific CSMPs were developed to address coordinated future operational improvement to the SR 99 corridor.[5] The CSMPs addressed State Highway Improvement Program (STIP) projects funded through the Proposition 1B bond measure integrated with the commitment to development of an Intelligent Transportation System (ITS) network as a means to manage congestion. Additionally, each CSMP specifically identified planned and programmed operational improvements with the potential to conserve future improvements to retain gains made in congestion alleviation. Additional operational measures that may complement the initial CSMPs are discussed.

Lane management may assist in improving corridor performance. Efforts to reduce lane changes and weaving will assist in sustaining a high proportion of estimated capacity in the face of greater demand.

Throughout District 10 bicycles and pedestrians are restricted from traveling on SR 99. Within urban areas parallel facilities can be identified often upon frontage roads, but rural street networks lack the infrastructure to permit bicycle uses beyond shared Class III lanes, and lack the necessary streetscape amenities for pedestrian use. Additional gaps arise at major river crossings.

Transit within the SR 99 corridor is limited to Amtrak, along with commuter and local service buses. Within District 10, Amtrak's time of operation does not coincide with the traditional work commute hours. Transit lacks the connectivity to permit interregional work commute travel successfully, given that Stockton serves as the largest regional employer and work trip attractor. Creating additional and extending current transit routes between San Joaquin County and Stanislaus County, with an express bus rapid transit (BRT) connection between Merced and Stockton with stops in the major cities in the corridor, would be beneficial.

The route is an important local, regional, and national goods movement corridor. SR 99's primary function is freight transport by truck—the percentage of traffic vehicles that are trucks generally varies between 13.4% and 14% of total Average Annual Daily Traffic (AADT) with a high of 26.4% reported for SR 99 in Turlock. Goods movement in the SR 99 corridor in District 10 includes a Class I railroad and fuel pipelines. Paralleling the route southwards from SR 120 on the southern edge of Manteca, the Union Pacific Railroad (UP) provides freight service to the cities along the corridor. Although the Burlington Northern Santa Fe Railroad (BNSF) roughly parallels SR 99, and provides both freight and passenger rail service (Amtrak-- San Joaquin Commuter), direct access within the corridor is limited to the Cities of Merced and Lodi. Historically, a jet fuel pipeline serving Castle Air Force Base (AFB) exists within the State right of way through Merced and extended southwards to Fresno to the Le Moore Naval Air Station. Currently a Pacific Gas and Electric natural gas pipeline within the right of way follows the route through Stanislaus and Merced Counties.

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[5] Although broken up by political boundaries, only the CSMP for Merced County's project might be considered to address logical termini.

Concept Summary

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<tr><td>MER 2</td><td>SR 140 east to SR 59 south</td><td rowspan="2">Four Lane Freeway</td><td rowspan="2">Operation needs currently unassessed</td></tr>
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<tr><td>MER 6</td><td>East Atwater Boulevard to west Atwater Boulevard.</td></tr>
<tr><td>MER 7</td><td>West Atwater Boulevard. to Hammatt Road</td><td>Six Lane Freeway</td></tr>
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SR99 CONCEPT SUMMARY (CONTINUED)					
Segment	**Segment Description**	**Existing Facility (2015)**	**Capital Facility Concept (2040)**	**20-25 Year System Operations and Management Concept**	**Post-25 Year Concept**
SJ 3	SR 120 west to SR 120 east	Six Lane Freeway	Eight Lane Freeway	Demand Management in Peak Hour	Eight Lane Freeway (HOV)
SJ 4	SR 120 east to Lathrop Road.				
SJ 5	Lathrop Road. to Arch Road				
SJ 6	Arch Rd. to Golden Gate Avenue (SR 4 east)				
SJ 7	Golden Gate Avenue (SR 4 east) to SR 4 west				
SJ 8	SR 4 west to SR 26				
SJ 9	SR 26 to SR 88				
SJ 10	SR 88 to Hammer Lane				
SJ 11	Hammer Lane to Kettleman Lane (SR 12 west)				
SJ 12	Kettleman Lane (SR 12 west) to Victor Road (SR 12 east)				
SJ 13	Victor Road (SR 12 east) to Turner Road	Four Lane Freeway			
SJ 14	Turner Road to Sacramento County Line				

Concept Rationale

The concept rationale is based on two factors: (1) the minimum LOS tolerable for peak hour conditions, and (2) the type of facility necessary to provide the concept LOS. The IRRS is a system of interregional state highway routes outside urbanized areas that provide access to, and links between the State's economic centers, major recreational areas, and urban and rural regions. The backbone of the IRRS are the interstates and some of the older US highways such as SR 99. The concept LOS for an IRRS route is C in rural areas, and D in urban areas.

Routes designated in the IRRS have a minimal facility of expressway. The expressed goal of the *Interregional Transportation System Plan* (ITSP, 1993) was to prioritize SHS expansion upon this system. The ITSP (1993) conceived a nested system of priority routes within the IRRS known as high emphasis routes, and within that category there was a second set, focus routes.[6] High emphasis routes tended to have large traffic volumes and important roles for goods movement. Focus routes were high emphasis routes with substantial unmet needs

[6] Interregional Transportation System Plan (1993)

attaining concept facility and LOS. There were two focus routes in District 10, SR 99 and SR 152. Given the State's funding limitations, the ITSP helped target priority funding for capital improvements upon the focus routes. For District 10, the two goals for upgrading SR 99 was to first eliminate gaps in the facility; and second to upgrade the route to an eight lane freeway throughout.

Only recently has SR 99 been upgraded to freeway throughout District 10. Urban portions of SR 99 have been constructed to freeway standard since the early 1960's. The last rural conventional highway segment was replaced in the late 1990's with the Livingston Bypass that also replaced the last traffic signal on SR 99. In the last fifteen years upgrade of expressway segments have been completed, and the facility is now freeway for its entire extent.

Reaching the second goal, that SR 99 becoming an eight lane facility is questionable at this time. A recent update to the ITSP (2013) considers the six lanes on SR 99 to fulfill concept.[7] However, this is contradicted by the focus route concept from the previous ITSP which identifies a four to eight lane freeway as concept[8] , consistent with the SR 99 Business Plan.

Consistency of the eight lane concept across district boundaries were also considered. For District 6, a six lane concept facility exists at present, with an eight lane freeway concept reported for an ultimate facility twenty five years out from the BY which for their SR 99 TCR is 2003 (this may be six through lanes with an auxiliary lane).[9] For District 3, a six lane concept is in place, with a six lane freeway concept with two additional HOV lanes identified as the ultimate facility twenty five years out from the BY of 2010.[10] Both TCRs conform with the currently proposed concept facility and future facility.

Presently, the ITSP (2015) has been updated with a changed planning emphasis. The latest version no longer employs the concept of a focus or high emphasis route, and has curtailed the highest planning emphasis upon SR 99 north of SR 4. However, the newest version does not address a uniform concept facility for the route, and for the purposes of this document, the concept facility outlined in the earlier ITSP (1993) applies.

The recent upgrades of SR 99 to freeway preclude the ability to assess performance. The lack of a real time measurement of traffic conditions along with new operational configurations for the BY provide little information for operational needs in the HY. Detection of traffic conditions, a goal of the three CSMPs for the route, resulted in laying out a schematic Intelligent Transportation System (ITS) layout on the route. Within San Joaquin County, the ITS architecture is relatively complete (with the exception of segments north of Lodi), such that demand management may be initiated through ramp metering within the next year. Upgrades in Stanislaus County, in Modesto northwards to Ripon are underway to permit ramp metering through one of the heavier traveled commuter corridors in the District.

Formulation of the concept facility was developed in coordination with planning in the three Metropolitan Planning Organization's (MPO) Regional Transportation Plans (RTP) in mind along with the ITSP, and the current SR 99 Business Plan. This conceptual facility would be six lanes in Merced County, south of the SR 140 W and SR 59 N interchange, but eight lanes to the north by 2040. Beyond the HY of 2040, the facility will be six multiple use lanes with two HOV lanes.

Actual modeling employing traffic and population growth indicate a far greater need varying from eight lanes in Merced beginning from SR 140 W in the City of Merced to SR 165 in the City of Turlock; increasing to ten lanes from SR 165 to Mitchell Road in the City of Ceres; twelve lanes in the City of Ceres between Mitchell Road and

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[7] ITSP Update (2013) p. 10

[8] ITSP Update (2013) p. 58

[9] District 6 *SR 99 TCR* (2003) p. 15

[10] District 3 *SR 99 TCR* (2010) p. 4; it should be noted that a draft 2017 TCR is in development.

Hatch Road; and increasing to fourteen between Hatch and SR 132; up to sixteen from the City of Modesto to the City of Ripon between SR 132 and Jack Tone Road; declining back to fourteen between Jack Tone Road and SR 120 W, down to ten lanes between SR 120 W and SR 120 E in Manteca, and further down to eight lanes between SR 120 and Arch Road; increasing to ten lanes in Stockton between Arch Road and SR 4 E, further increasing to twelve lanes through the City of Stockton between SR 4 E and Hammer Lane. From Hammer Lane north to the Sacramento County the concept facilities agree at eight lanes.

For highway design and planning purposes, LOS characterizes conditions of high traffic speeds (45 to 70 MPH), along with a low number of stop controlled intersections. The condition is referred to as uninterrupted flow. Increasing the number of access points (e.g. ramps, intersections, and driveways) can effectively reduce LOS given the same traffic volume. For freeways, the factor is interchange spacing, as sufficient distance allows a more orderly merging and diverging of traffic (weaving) between freeway ramps. For a freeway, it is highly desirable to have interchanges spaced at intervals of more than a mile apart in urban areas, two miles apart in rural areas, and two miles between freeway to freeway interchanges and a subsequent interchange.[11] Much of the freeway segments on SR 99 were built between 1953 and 1963 and lack the current interchange spacing. Recent interchange projects replaced older interchanges (Main Street, Farmington Road) with a new one farther apart from existing interchanges (Golden Gate Avenue) or expanded the facility by installing of auxiliary lanes to reduce weaving (between Kiernan Road and Pelandale Avenue).

The alternative to increasing highway capacity is to manage peak hour traffic volumes. By shifting to demand management strategies, the goal is to optimize capacity at periods of peak use, or redistribute vehicle travel away from peak times[12]. Demand management efforts include incentivizing mode shift away from single occupancy passenger vehicles, nine eighty or ten forty work schedules, telecommuting, ramp metering, integrated corridor management, and similar strategies. For SR 99 this should include strategies to reduce weaving, as the movement requires space in two lanes, rather than the single travel lane. To some degree, ramp metering in reducing the number of vehicles on the freeway may reduce weaving's impact on capacity. However this may not be enough in segments where large amounts of capacity are consumed in weaving movements. Consideration should be given to educating drivers to remain in their lanes when commuting through informal lane management (e.g. Changeable Message Signs requesting long distance drivers employ particular lanes in contrast with short distance trips employing other lanes).

Proposed Projects and Strategies

There is an effort to upgrade the facility to six lanes throughout the district[13], which should be accomplished by the HY of 2040. However, existing need is to see a facility with eight mixed use lanes from the 'V' Street (SR 140 W and SR 59 N) interchange north to Sacramento County, and if possible conversion of two mixed use lanes to managed lanes from SR 165 to SR 120 W, continuing west on SR 120, I 205 and I 580 towards the Bay Area. The facility in Stanislaus County is currently six lanes. Merced County Association of Governments (MCAG) proposes to upgrade the portions of SR 99 to six lanes in the Cities of Merced and Atwater as an unconstrained project[14] San Joaquin Council of Governments' (SJCOG) RTP proposes to fund environmental work on expansion of SR 99 between Harney Lane and Turner Road in Lodi for a six lane facility, but with the construction funding unconstrained as yet.[15]

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[11] *Highway Design Manual*, Sixth Edition, 2006, p. 500-1

[12] See *Caltrans District 10 RCTO and ITS/Ops Plan* (2017)

[13] An effort to expand SR 99 to six lanes from the City of Livingston to Stanislaus County is programmed, but lacks a full funding commitment at this time.

[14] MCAG RTP 2014 p. 36

[15] SJCOG RTP Appendices F "Project List" and Appendix R "Unconstrained Project List"

Construction of new interchanges include an unconstrained effort to extend March Lane to SR 99 in Stockton, and connect to Wilson Way. The effort would likely close the existing Cherokee Lane and Wilson Way interchanges.[16] The project would likely increase the interchange spacing between Waterloo Road (SR 88) Interchange and Hammer Lane Interchange, with the potential to reduce weaving.

Earlier efforts to augment intersection spacing included the consolidation of the 'R' Street and 'V' Street interchanges in Merced into a single 'couplet' with the intervening on ramps and off ramps eliminated. Similar efforts might be attempted within the Cities of Merced or Modesto where interchange spacing does not meet current minimal design spacing.

Ramp meters throughout SR 99 from Turlock to Lodi should be operational by the HY of 2040 given the current network of planned ramp meters on SR 99. Currently, ramp meters have been constructed on SR 99 in San Joaquin County between Austin Road and Hammer Lane, with a second project to install ramp meters between Pelandale Road in Modesto and SR 120 E (Yosemite Avenue) programmed.[17] The priority for implementation is unclear, as earlier ramp metering plans identified three levels of priority with years to implementation without identifying a base year for implementation to start from. The current plan only identifies high priority, again without a base year. In the earlier plans, ramp metering was to be operating on SR 99 from the intersection with SR 120 W north to Hammer Lane within five to ten years; from Hammer Lane south to Arch Road, from SR 120 W and Mitchell Road in both directions, and between Mission Avenue and 'R' Street in both directions within ten to twenty years; and from Arch Road south to SR 120 W after twenty years. The current plan places the higher priority on urban ramp meters in San Joaquin County between Main Street in Ripon and SR 12 E (Victor Road) Lodi, with lower priority given to 1.) rural interchanges in San Joaquin County; 2.) all interchanges throughout Stanislaus County; and, 3.) three north bound ramps between 'V' Street and Franklin Road in Merced County.[18]

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[16] SJCOG RTP Appendix R "Unconstrained Project List"

[17] SOP September 2016

[18] Ramp Metering Development Plan (2013), pp 124-131. Further details may be found in the Regional Concept of Transportation Operations Plan and the Intelligent Transportation Systems and Operations Plan.

CORRIDOR OVERVIEW

ROUTE SEGMENTATION

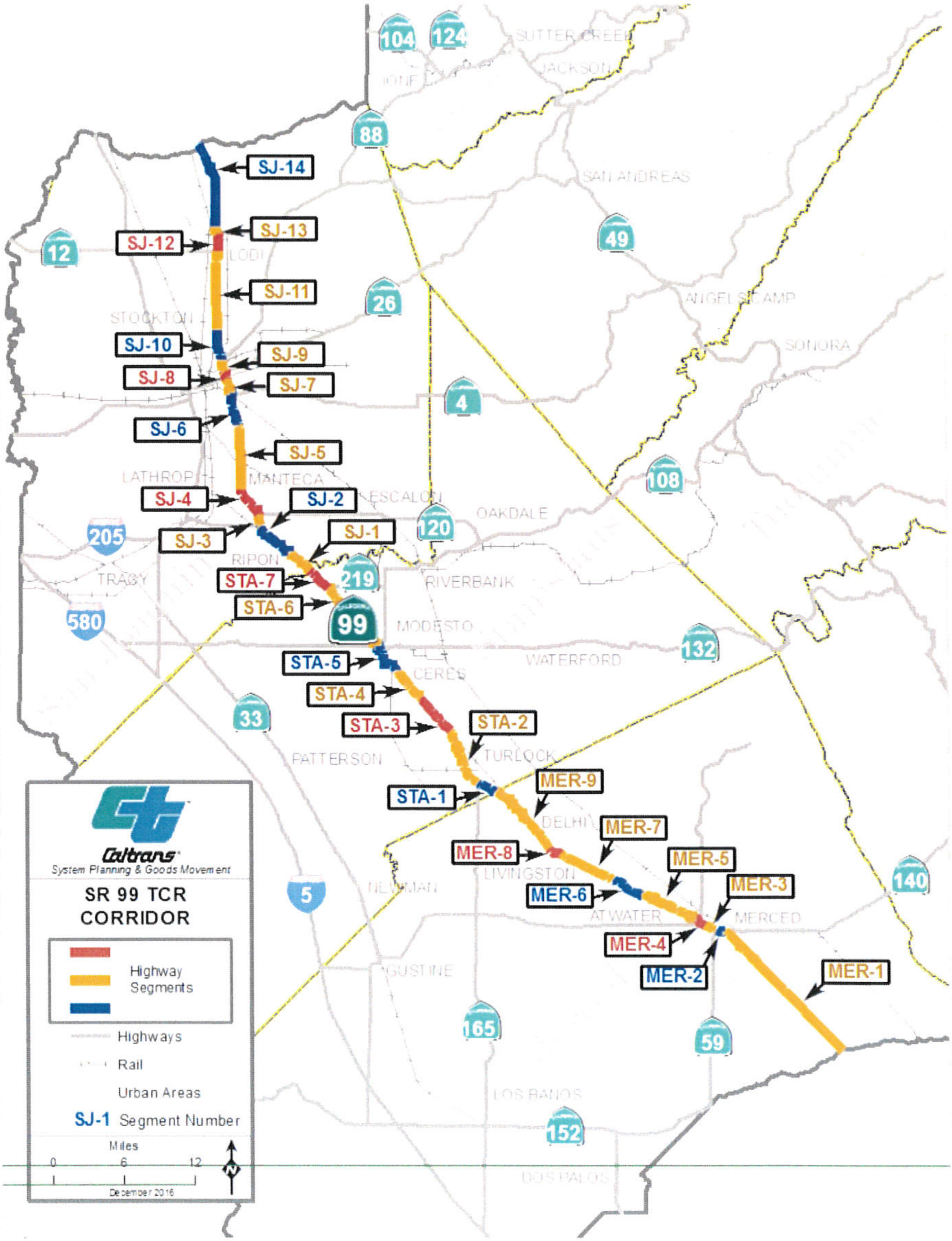
The division of the SR 99 into homogeneous segments followed District 10's practice. Those segments conformed to land use planning boundaries, changes in population density (rural versus urban), and intersections with other SHS. Segmentation resulted in the creation of thirty segments, nine in Merced County, seven in Stanislaus County, and fourteen in San Joaquin County.

Segment MER 1 extends from the Madera County line to SR 140 east as a six lane freeway with four interchanges. MER 2 connects SR 140 east with SR 59 south (Martin Luther King Boulevard) as a four lane freeway in the City of Merced. MER 3 remains a four lane freeway that connects SR 59 South to the 'R' and 'V' Streets couplet that access both SR 59 North and SR 140 west. MER 4, the last four lane freeway segment in the City of Merced connects 'V' Street to 16th Street. MER 5 connects 16th Street to East Atwater Boulevard as a six lane freeway. MER 6, within the City of Atwater, is a four lane freeway between East Atwater Boulevard and West Atwater Boulevard. MER 7 connects the Cities of Atwater and Livingston with a six lane freeway segment from West Atwater Boulevard to Hammatt Road. MER 8 is within the City of Livingston as a six lane freeway between Hammatt Road and Winton Road. The remaining segment, MER 9 is a four lane freeway, soon to be widened to six lanes, between Winton Road and the Stanislaus County line.

In Stanislaus County, all segments are six lane freeways. STA 1 runs from the Merced County line to SR 165 (Lander Avenue). STA 2 extends from SR 165 to Taylor Road through the City of Turlock. STA 3 runs from Taylor Road to Mitchell Road. STA 4 extends from Mitchell Road to Hatch Road in the City of Ceres. STA 5 connects Hatch Road and SR 132 (Maze Avenue) along with STA 6 that runs from SR 132 to SR 219 (Kiernan Road) both within the City of Modesto. The last segment, STA 7, runs from SR 219 (Kiernan Road) to the San Joaquin County line.

In San Joaquin, SR 99 is currently constructed to six lane freeway facility with the exception of the portion in Lodi and north to the Sacramento County line. Segment SJ 1 runs from the Stanislaus County line to Jack Tone Road in the City of Ripon. SJ 2 extends from Jack Tone Road to SR 120 west. SJ 3 connects SR 120 west to SR 120 east, and combined with SJ 4 from SR 120 east to Lathrop Road include the City of Manteca. SJ 5 runs from Lathrop Road to Arch Road. SR 99 within the City of Stockton includes five segments: SJ 6 from Arch Road to SR 4 east, SJ 7 from SR 4 east to SR 4 west; SJ 8 from SR 4 west to SR 26; SJ 9 from SR 26 to SR 88; and, SJ 10 from SR 88 to Hammer Lane. Between the Cities of Stockton and Lodi is SJ 11 connecting Hammer Lane to SR 12 west. Within the City of Lodi are two segments; SJ 12 between SR 12 west and SR 12 east, and SJ 13 between SR 12 east and Turner Road. The final segment, SJ 14 extends from Turner Road to the Sacramento County line.

ROUTE SEGMENTATION			
Segment	Location Description	County_Route_Beg. PM	County_Route_End PM
MER 1	Madera County Line to SR 140 east	MER_99_0.00	MER_99_13.86
MER 2	SR 140 east to SR 59 south	MER_99_13.86	MER_99_14.696
MER 3	SR 59 south to SR 140 west	MER_99_14.696	MER_99_15.799
MER 4	SR 140 west to 16th Street	MER_99_15.799	MER_99_16.98
MER 5	16th Street to East Atwater Boulevard.	MER_99_16.98	MER_99_21.612
MER 6	East Atwater Boulevard. to West Atwater Boulevard	MER_99_21.612	MER_99_23.642
MER 7	W Atwater Boulevard. to Hammatt Avenue	MER_99_23.642	MER_99_29.001
MER 8	Hammatt Avenue. to Winton Road	MER_99_29.001	MER_99_30.379
MER 9	Winton Road to Stanislaus County Line	MER_99_30.379	MER_99_37.302
STA 1	Merced County Line to SR 165	STA_99_R0.0	STA_99_R1.63
STA 2	SR 165 to Taylor Road	STA_99_R1.63	STA_99_R6.75
STA 3	Taylor Road to Mitchell Road	STA_99_R6.75	STA_99_R10.04
STA 4	Mitchell Road to Hatch Avenue	STA_99_R10.04	STA_99_R13.27
STA 5	Hatch Avenue to Maze Avenue (SR 132)	STA_99_R13.27	STA_99_R16.12
STA 6	Maze Avenue (SR 132) to Kiernan Road (SR 165)	STA_99_R16.12	STA_99_R22.56
STA 7	Kiernan Road (SR 219) to San Joaquin County Line	STA_99_R22.56	STA_99_R24.75
SJ 1	Stanislaus County Line to Jack Tone Road	SJ_99_0.00	SJ_99_2.38
SJ 2	Jack Tone Road to SR 120 west	SJ_99_2.38	SJ_99_5.82
SJ 3	SR 120 west to SR 120 east	SJ_99_5.82	SJ_99_6.65
SJ 4	SR 120 east to Lathrop Road	SJ_99_6.65	SJ_99_9.18
SJ 5	Lathrop Road to Arch Road	SJ_99_9.18	SJ_99_14.61
SJ 6	Arch Road to Golden Gate Drive (SR 4 east)	SJ_99_14.61	SJ_99_17.22
SJ 7	Golden Gate Drive(SR 4 east) to SR 4 west	SJ_99_17.22	SJ_99_18.68
SJ 8	SR 4 west to SR 26	SJ_99_18.68	SJ_99_19.29
SJ 9	SR 26 to SR 88	SJ_99_19.29	SJ_99_20.34
SJ 10	SR 88 to Hammer Lane	SJ_99_20.34	SJ_99_22.92
SJ 11	Hammer Lane to Kettleman Lane (SR 12 west)	SJ_99_22.92	SJ_99_29.50
SJ 12	Kettleman Lane (SR 12 west) to Victor Road (SR 12 east)	SJ_99_29.50	SJ_99_30.97
SJ 13	Victor Road (SR 12 east) to Turner Road	SJ_99_30.97	SJ_99_31.58
SJ 14	Turner Road to Sacramento County Line	SJ_99_31.58	SJ_99_38.79


Caltrans
System Planning & Goods Movement
SR 99 TCR CORRIDOR
Highway Segments
Highways
Rail
Urban Areas
SJ-1 Segment Number
Miles
0
6
12
December 2016
SJ-14
SJ-13
SJ-12
SJ-11
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SJ-7
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STA-1
MER-9
MER-8
MER-7
MER-6
MER-5
MER-4
MER-3
MER-2
MER-1
LODI
STOCKTON
LATHROP
MANTECA
ESCALON
OAKDALE
RIPON
TRACY
RIVERBANK
MODESTO
WATERFORD
CERES
PATTERSON
TURLOCK
DELHI
LIVINGSTON
NEWMAN
ATWATER
MERCED
GUSTINE
LOS BANOS
DOS PALOS
SUTTER CREEK
JACKSON
IONE
SAN ANDREAS
ANGELS CAMP
SONORA

Route Location:

A fragment of an older and longer highway (US 99), SR 99 currently extends from I-5 south of Bakersfield northwards to Sacramento where it intersects SR 50 and Business I-80. Following SR 50 and I-5 to the northern city limits of Sacramento, SR 99 continues northwards to its terminus at SR 36 east of Red Bluff. Prior to the completion of I-5 in the 1970's, SR 99 or US 99 originated from Calexico on the Mexican border, headed north to Riverside, and then west to Los Angeles, and from Los Angeles the route continued north to the Oregon border along its current route (with the exception of US 99 W which is now I-5 between Sacramento and Red Bluff), and extended into Washington to the Canadian border. Within District 10, SR 99, originally designated Legislative Route (LR) 4 or the Golden State Highway, historically followed the Southern Pacific Railroad (now the Union Pacific Railroad) mainline in the San Joaquin Valley. Portions of older relinquished urban alignments (often designated Business 99) can be found in the cities of Stockton, Manteca, Ripon, Modesto, Turlock, Livingston, Atwater, and Merced within District 10, as well as Fresno farther south. North from Stockton, LR 4 followed what is now Wilson Way along the current alignment to Lodi, followed Cherokee Lane through Lodi, and resumed on the existing alignment to Galt.

Route Purpose:

Supporting both commuter travel and freight transport, SR 99 acts as one of the predominant north to south transportation arteries for the San Joaquin Valley, providing part of the backbone of the SHS in common with I-5. Compared to I-5 within the San Joaquin Valley, SR 99 has local, regional, statewide, and national significance, while I-5 predominantly performs as an interregional connection between California's San Francisco Bay Region (The Bay Area) and Southern California (the Southland), as well as linking to Mexico and Oregon. Unlike I-5, SR 99 supports local and interregional work commutes, as well as a substantial portion of the State's interregional and interstate freight movement.

Current planning efforts have targeted congestion reduction on SR-99 through operational improvements and traffic demand management. A second effort to enhance the ability of secondary east west routes to shunt traffic between SR 99 and I-5 is in development.[19]

Major Route Features:

A key consideration in the future development of SR 99 as a transportation corridor is the relative lack of right of way along the corridor for capacity expansion. Lack of right of way limits the concept facility to eight lanes for automobile transportation, while competing plans for additional multiple use lanes and for operational improvements such as auxiliary lanes and managed lanes will require all available space. The limited space within the right of way will adversely affect development of other modal infrastructure such as commuter and light rail; bicycle lanes; and pedestrian paths. This will potential lead to further public investment in locating these facilities away from SR 99.

Route Designations and Characteristics:

SR 99 is included in the IRRS, FES, and NHS for its entire extent. As an NHS route it is also designated a part of the National Truck Network (NTN), and included in the Strategic Highway Network (from SR 4 south to Madera County and beyond). Throughout the corridor the facility is a freeway four or six lanes wide, and the corridor is a significant goods movement route. SR 99 is not designated or eligible to be designated a State Scenic Highway. Local transportation planning is handled by the three MPOs—MCAG, STAN COG, and SJCOG. Land use planning is carried out by various county or city planning agencies.

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[19] The draft *I-5 Goods Movement Safety Corridor Study* being developed by SJCOG along with other Valley MPOs.

Designation or initiation of a managed lane network on the facility is not expected until after the HY of 2040. Shortfalls in addressing need along the corridor that feed into the Bay Area commute are ideal candidates for upgrade to at least eight lanes with six multipurpose and two high occupancy vehicle (HOV) lanes. Lower property values in District 10 have attracted both Bay Area households and Sacramento commuters to settle in the San Joaquin Valley, this has increased the traffic volume for the interregional commute from Stanislaus and San Joaquin Counties into both regions. This resettlement pattern creates a need for a seamless HOV network from as far south as the City of Merced north into Sacramento County on SR 99.

<table>
<tr><th colspan="10">ROUTE DESIGNATIONS & CHARACTERISTICS</th></tr>
<tr><td>Segment #</td><td>MER 1</td><td>MER 2</td><td>MER 3</td><td>MER 4</td><td>MER 5</td><td>MER 6</td><td>MER 7</td><td>MER 8</td><td>MER 9</td></tr>
<tr><td>FES</td><td colspan="9">Yes</td></tr>
<tr><td>NHS</td><td colspan="9">Yes</td></tr>
<tr><td>STRAHNET</td><td colspan="9">Yes</td></tr>
<tr><td>Scenic Highway</td><td colspan="9">No</td></tr>
<tr><td>IRRS</td><td colspan="9">Yes</td></tr>
<tr><td>Federal Functional Classification</td><td colspan="9">Freeway</td></tr>
<tr><td>Goods Movement Route</td><td colspan="9">Yes</td></tr>
<tr><td>Truck Designation</td><td colspan="9">National Truck Network</td></tr>
<tr><td>Rural/Urban/ Urbanized</td><td>Rural</td><td colspan="3">Urban</td><td>Rural</td><td>Urban</td><td>Rural</td><td>Urban</td><td>Rural</td></tr>
<tr><td>MPO</td><td colspan="9">Merced Council of Area Governments</td></tr>
<tr><td>Local Agency</td><td>Merced County</td><td colspan="3">City of Merced</td><td>Merced County</td><td>City of Atwater</td><td>Merced County</td><td>City of Livingston</td><td>Merced County</td></tr>
<tr><td>Tribes</td><td colspan="9">No federally recognized tribes</td></tr>
<tr><td>Air District</td><td colspan="9">San Joaquin Valley Air Pollution Control District</td></tr>
<tr><td>Terrain</td><td colspan="9">Flat</td></tr>
</table>

<table>
<tr><th colspan="8">ROUTE DESIGNATIONS & CHARACTERISTICS (Continued)</th></tr>
<tr><td>Segment #</td><td>STA 1</td><td>STA 2</td><td>STA 3</td><td>STA 4</td><td>STA 5</td><td>STA 6</td><td>STA 7</td></tr>
<tr><td>FES</td><td colspan="7">Yes</td></tr>
<tr><td>NHS</td><td colspan="7">Yes</td></tr>
<tr><td>STRAHNET</td><td colspan="7">Yes</td></tr>
<tr><td>Scenic Highway</td><td colspan="7">No</td></tr>
<tr><td>IRRS</td><td colspan="7">Yes</td></tr>
<tr><td>Federal Functional Classification</td><td colspan="7">Freeway</td></tr>
<tr><td>Goods Movement Route</td><td colspan="7">Yes</td></tr>
<tr><td>Truck Designation</td><td colspan="7">National Truck Network</td></tr>
<tr><td>Rural/Urban/ Urbanized</td><td colspan="2">Urbanized</td><td>Urban</td><td colspan="3">Urbanized</td><td>Urban</td></tr>
<tr><td>MPO</td><td colspan="7">Stanislaus Council of Governments</td></tr>
<tr><td>Local Agency</td><td colspan="2">City of Turlock</td><td>Stanislaus County</td><td>City of Ceres</td><td colspan="2">City of Modesto</td><td>Stanislaus County</td></tr>
<tr><td>Tribes</td><td colspan="7">No federally recognized tribes</td></tr>
<tr><td>Air District</td><td colspan="7">San Joaquin Valley Air Pollution Control District</td></tr>
<tr><td>Terrain</td><td colspan="7">Flat</td></tr>
</table>

<table>
<tr><th colspan="10">ROUTE DESIGNATIONS & CHARACTERISTICS (Continued)</th></tr>
<tr><td>Segment #</td><td>SJ-1</td><td>SJ 2</td><td>SJ 3</td><td>SJ 4</td><td>SJ 5</td><td>SJ 6</td><td>SJ 7</td><td>SJ 8</td><td>SJ 9</td></tr>
<tr><td>FES</td><td colspan="9">Yes</td></tr>
<tr><td>NHS</td><td colspan="9">Yes</td></tr>
<tr><td>STRAHNET</td><td colspan="7">Yes</td><td colspan="2">No</td></tr>
<tr><td>Scenic Highway</td><td colspan="9">No</td></tr>
<tr><td>IRRS</td><td colspan="9">Yes</td></tr>
<tr><td>Federal Functional Classification</td><td colspan="9">Freeway</td></tr>
<tr><td>Goods Movement Route</td><td colspan="9">Yes</td></tr>
<tr><td>Truck Designation</td><td colspan="9">National Truck Network</td></tr>
<tr><td>Rural/Urban/ Urbanized</td><td>Urban</td><td>Rural</td><td>Urbanized</td><td>Urbanized</td><td>Rural</td><td>Urban</td><td>Urbanized</td><td>Urbanized</td><td>Urbanized</td></tr>
<tr><td>MPO</td><td colspan="9">San Joaquin Council of Governments</td></tr>
<tr><td>Local Agency</td><td>City of Ripon</td><td>Cities of Ripon and Manteca</td><td colspan="2">City of Manteca</td><td>San Joaquin County</td><td colspan="4">City of Stockton</td></tr>
<tr><td>Tribes</td><td colspan="9">No federally recognized tribes</td></tr>
<tr><td>Air District</td><td colspan="9">San Joaquin Valley Air Pollution Control District</td></tr>
<tr><td>Terrain</td><td colspan="9">Flat</td></tr>
</table>

ROUTE DESIGNATIONS & CHARACTERISTICS (Continued)					
Segment #	SJ 10	SJ 11	SJ 12	SJ 13	SJ 14
FES	Yes				
NHS	Yes				
STRAHNET	No				
Scenic Highway	No				
IRRS	Yes				
Federal Functional Classification	Freeway				
Goods Movement Route	Yes				
Truck Designation	National Truck Network				
Rural/Urban/ Urbanized	Urbanized	Rural	Urbanized		Rural
MPO	San Joaquin Council of Governments				
Local Agency	City of Stockton	San Joaquin County	City of Lodi		San Joaquin County
Tribes	No federally recognized tribes				
Air District	San Joaquin Valley Air Pollution Control District				
Terrain	Flat				

COMMUNITY CHARACTERISTICS

Highway planning has affected both the physical layout and organization of communities along the SR 99 corridor. Historically, SR 99 as the Golden State Highway in the San Joaquin Valley was constructed adjacent to the alignment of the Southern Pacific Railroad (now the Union Pacific or UP). Although originally an ideal meshing of multimodal freight opportunities, the railroad and its associated land use and infrastructure constrained the opportunity to expand highway capacity and replace the conventional highway with freeway during the interregional expansion of the work commute. New freeway alignments away from the Class I railroad occurred in all cities in the corridor but Ripon. Many of the abandoned highway alignments coincided with businesses dependent upon automobile or truck traffic--industrial areas, commercial districts, and downtowns. These businesses and services became located upon local streets subject to local design preferences, maintenance, and control while losing direct access to SR 99. In response, freight dependent businesses had to either relocate, or work with the local governments to improve accessibility to freeway interchanges. In so doing, the improved access impaired both the aesthetic appearance of the local streetscape, and its capacity to provide for active transportation along these access routes. Bridges crossing freeways often lacked means for safe pedestrian or bicycle crossing due to nonexistent or narrow walkways, lacking access ramps, with narrow shoulders. In many contexts, the new freeway separated schools from students, necessitating parents to transport children to school by car.

Considered a potential "Main Street of the San Joaquin Valley",[20] SR 99 provides access to work for the majority of workers in the urban San Joaquin Valley (approximately 90% of District 10's current population of 1,653,646 resides in the San Joaquin Valley[21]) as well as 25% of interregional commuters from Alpine, Amador, Calaveras, Tuolumne, and Mariposa Counties.[22] There are ten incorporated cities and eight towns or enclaves served by SR 99: the cities of Merced (78,959), Atwater (28,168), Livingston (13,058), Turlock (69,733), Ceres (45,417), Modesto

[20] From the *Route 99 Corridor Enhancement Master Plan* discussing the work of the Great Valley Center Highway 99 Task Force (p. 13)
[21] Census 2014
[22] DSMP 2015

(201,165), Ripon (14,297), Manteca (71,948), Stockton (291,707), and Lodi (62,174), along with the communities or Census Designated Places (CDP) of Franklin (6,149), Delhi (10,755), Keyes (4,575), Salida (13,722), Garden Acres (10,648) Morada (3,726), Acampo (341), and Collierville (1,934). Their total population constitutes more than half of the population in District 10. However, in none of these communities has SR 99 ever directly accessed their downtowns, their commercial and retail centers or their government and administration centers, rendering the claim "Main Street of the San Joaquin Valley" something of a misnomer.

SELECT DEMOGRAPHIC COMPARISON BETWEEN DISTRICT 10 AND CALIFORNIA (2006-2010)[23]

	Growth Rate (2015-2016)[24]	white, non-Latino	Latino	Other	Median Household Income	Households below Poverty Line	Lower Income Households not in Poverty	Middle Income and Upper Income Households[25]
Merced	1.0%	30.7%	48.7%	10.6%	$36,273	23.91%	16.14%	59.95%
Atwater	1.3%	37.1%	47.4%	15.5%	$42,274	18.04%	13.31%	68.65%
Livingston	0.8%	8.1%	72.7%	19.1%	$45,856	15.31%	15.83%	68.86%
Turlock	1.0%	54.6%	34.0%	11.4%	$50,615	13.37%	13.56%	73.07%
Ceres	1.0%	33.1%	52.5%	14.4%	$50,103	15.82%	11.11%	73.07%
Modesto	0.8%	50.7%	35.2%	14.1%	$50,533	14.00%	11.09%	74.91%
Ripon	1.1%	67.5%	21.4%	11.1%	$74,877	8.48%	6.87%	84.65%
Manteca	2.3%	49.0%	36.8%	14.2%	$60,957	8.45%	7.77%	83.78%
Stockton	0.8%	24.3%	38.8%	26.9%	$47,995	17.18%	11.92%	70.90%
Lodi	0.7%	57.4%	33.2%	9.4%	$48,910	13.81%	11.36%	74.83%
District 10	1.0%	44.6%	38.4%	17.0%	$49,190	14.26%	10.94%	74.80%
California	0.9%	41.2%	36.7%	22.1%	$61,094	12.05%	9.16%	78.89%

Certain patterns can also be seen by comparing the demographic and economic characteristics of California, District 10, and the cities served by SR 99. Percentagewise, District 10 compared to California has a larger white non-Hispanic population (WNHP), and a larger Hispanic population (HP). The higher percentages of these two categories suggest District 10 may not be as ethnically diverse as the rest of the State. Noteworthy is that all cities along the SR 99 corridor (except for Stockton) have even higher percentages of WNHP and HP compared to District 10. For District 10 almost 28% of all ethnic groups not WNHP and HP are found in Stockton. This would suggest that public outreach efforts to individuals for whom English is not their primary language might require greater effort and expense in Stockton due to its diversity when compared to efforts elsewhere in the District.[26]

District 10 has a substantially lower median household income compared to California. This appears due to the lower percentage of households in the District that are middle class. Only five of the cities served by SR 99 have median household incomes in excess of those for District 10-- Ripon, Manteca, Turlock, Modesto, and Ceres. Although a higher proportion of a population being non-white has often been taken as an indication of lower wages and underemployment, this assumption does not appear to hold up for the cities in the corridor. Although further assessment might be needed, the potential explanation may be whether or not a larger percentage of households in a community access employment from the Bay Area or Sacramento regions. The greater number of households that are impoverished in District 10 compared to California also indicates the likelihood of a higher probability for a community or a neighborhood to be subject to, or have experienced in its past, environmental injustice, as suggested by the efforts by UC Davis to map and characterize its distribution in the San Joaquin Valley.[27]

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[23] CTPP 2006-2010 except for recent growth rates obtained from the Department of Finance (DOF).

[24] DOF, 2016

[25] Middle class income is defined at 150% over or above of the federal poverty line

[26] The weakness in making this estimate is that it assumes an HP that is ethnically homogeneous.

[27] Cumulative Environmental Vulnerability and Environmental Justice in California's San Joaquin Valley. *International Journal of Environmental Research and Public Health* (2012) 9: 1593-1608.

A key contribution system planning can make to address environmental justice is to consider in the current and future planning of new highways and realignments that proposed solutions do not exacerbate the exposure of residents to additional noise and air pollution when their communities have a past history of disproportionate exposure to these and other disamenities. A second consideration is the role highways have, and have had, in diminishing community cohesion. This pattern is evident in the larger and older cities of District 10: Merced, Modesto, and Stockton, where pockets of relatively impoverished ethnic enclaves can be found on one side of the freeway while many services such as government, schools, hospitals, markets and commercial establishments might be found on the other side.

LAND USE

The expansion of SR 99 as a freeway is complete, and is unlikely to require the setting aside of future right of way. All urban expansions of the facility from four to six (and possibly eight) lanes employ existing right of way. Although there are at least thirteen land use planning agencies that SR 99 passes through in District 10, few have set aside right of way in their General Plans (GP) to allow further expansion of the facility. Many GPs have permitted adjoining land uses consistent with freeway accessibility and commercial development adjacent to freeways, making right of way acquisition financially infeasible. In the short term, multimodal transportation commuter access along the corridor will likely rely upon car pools and buses, rather than rail transit for similar reasons.

Although the SR 99 corridor in District 10 likely lacks the population density expected for the implementation of Smart Mobility efforts, the key factor is the region wide lack of multi-unit housing (approximately 30% of all housing in California is multiunit, while it is less than 15% of all housing in District 10) while housing ownership in the corridor is relatively the same as for the State.[28] Although the percentage of housing for rent is equal between District 10 and the State, the number of detached housing units rented in District 10 remains far greater.[29]

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[28] Table 3, DSMP (2015).
[29] Table 4, DSMP (2015).

LAND USE	
Segment	**Place Type[30]**
MER 1	5b—Rural Settlements and Agricultural Lands
MER 2	3—Compact Communities
MER 3	3—Compact Communities
MER 4	3—Compact Communities
MER 5	4b—Corridors
MER 6	4a--Centers
MER 7	5b—Rural Settlements and Agricultural Lands
MER 8	4d--Neighborhoods
MER 9	4d--Neighborhoods
STA 1	4a--Centers
STA 2	4c—Dedicated Use Areas
STA 3	5b—Rural Settlements and Agricultural Lands
STA 4	4b--Corridors
STA 5	4a--Centers
STA 6	4c—Dedicated Use Areas
STA 7	4c—Dedicated Use Areas
SJ 1	4c—Dedicated Use Areas
SJ 2	5b—Rural Settlements and Agricultural Lands
SJ 3	4c—Dedicated Use Areas
SJ 4	4d--Neighborhoods
SJ 5	5b—Rural Settlements and Agricultural Lands
SJ 6	4c—Dedicated Use Areas
SJ 7	4d--Neighborhoods
SJ 8	4d--Neighborhoods
SJ 9	4c—Dedicated Use Areas
SJ 10	4c—Dedicated Use Areas
SJ 11	5b—Rural Settlements and Agricultural Lands
SJ 12	4c—Dedicated Use Areas
SJ 13	4c—Dedicated Use Areas
SJ 14	5b—Rural Settlements and Agricultural Lands

[30] Land use designations taken from the Smart Mobility Framework (2012), the lower the number for the place type, the greater the suitability for SMART mobility development.

System Characteristics

As a corridor, there is little variability in SR 99's characteristics. The corridor throughout is freeway, with restricted bicycle and pedestrian access. The number of multiple use lanes may vary from six in rural contexts to four in urban, with a need for the system to be upgraded to include eight lanes throughout by 2040. There are no managed lanes present or planned for within the next twenty four years—it would be desirable to see them installed with the eight lane facility, but this will depend on logical termini with access to the Bay Area's managed lane network on I-580. Auxiliary lanes between the Pelandale Road and the SR 219 interchanges (STA 6) are programmed, along with the three planned auxiliary lanes: 1.) between the Monte Vista Road and the Taylor Road interchanges (STA 2); 2.) between the Taylor Road and the Keyes Roads interchanges (STA 3); and, 3.) between the Hatch Road and the Ninth Street interchanges (STA 5). An integrated ITS system may be found within most post miles of San Joaquin County, but facilities will require further upgrade in Stanislaus and Merced Counties to permit both demand and incident management throughout the corridor. An effort by the District to implement Integrated Corridor Management system by developing a Regional Concept of Transportation Operations (RCTO) and an ITS/Operational Plan are complete, and further refine the schedule and scope of integration of the ITS system and other operational controls along the SR 99 corridor to potentially further maximize corridor performance.[31]

[31] Draft Caltrans District 10 RCTO and ITS/Ops Plan (2017)

SYSTEM CHARACTERISTICS[32]									
Segment #	**MER 1**	**MER 2**	**MER 3**	**MER 4**	**MER 5**	**MER 6**	**MER 7**	**MER 8**	**MER 9**
Existing Facility									
Facility Type	Freeway								
General Purpose Lanes	6	4	4	4	6	4	6	6	4
Lane Miles	83.16	3.2	4.84	4.72	27.78	8.12	32.16	8.34	27.68
Centerline Miles	13.86	0.8	1.21	1.18	4.63	2.03	5.36	1.39	6.92
Auxiliary Lanes	None								
20-25 Year Concept Facility									
Facility Type	Freeway								
General Purpose Lanes	6	6	6	8	8	8	8	8	8
Lane Miles	83.16	4.8	7.26	7.08	27.78	12.18	32.16	8.34	41.52
Centerline Miles	13.86	0.8	1.21	1.18	4.63	2.03	5.36	1.39	6.92
Aux Lanes	None								
Post 25 Year Facility									
Facility Type	Freeway								
General Purpose Lanes	6	6	6	8	8	8	8	8	8
Lane Miles	83.16	4.8	7.26	7.08	27.78	12.18	32.16	8.34	41.52
Centerline Miles	13.86	0.8	1.21	1.18	4.63	2.03	5.36	1.39	6.92
HOV Lanes	Two								
Aux Lanes	None								
TMS Elements									
TMS Elements (BY)	TMS	TMS	TMS	TMS	TMS	TMS	TMS	TMS	TMS
	CMS		EMS	HAR		RMS	CMS		CMS
	CCTV		CMS				CCTV		CCTV
	RWIS		CCTV				RWIS		RWIS
	HAR								
TMS Elements (HY)				CMS	CMS				
				CCTV	CCTV				
					RWIS				

[32] Acronyms--TMS: Traffic Monitoring Station; CMS: Changeable Message Sign; CCTV: Closed Circuit Television; RWIS: Roadside Weather Information Station; HAR: Highway Advisory Radio

SYSTEM CHARACTERISTICS (CONTINUED)							
Segment #	STA 1	STA 2	STA 3	STA 4	STA 5	STA 6	STA 7
Existing Facility							
Facility Type	Freeway						
General Purpose Lanes	6						
Lane Miles	9.78	30.72	19.74	19.38	17.1	38.64	13.14
Centerline Miles	1.63	5.12	3.29	3.23	2.85	6.44	2.19
Auxiliary Lanes	No						
20-25 Year Concept Facility							
Facility Type	Freeway						
General Purpose Lanes	8						
Lane Miles	13.04	40.96	26.32	25.84	22.8	51.52	17.52
Centerline Miles	1.63	5.12	3.29	3.23	2.85	6.44	2.19
Aux Lanes	None	None	None	None	None	Yes	None
Post 25 Year Facility							
Facility Type	Freeway						
General Purpose Lanes	8						
Lane Miles	13.04	40.96	26.32	25.84	22.8	51.52	17.52
Centerline Miles	1.63	5.12	3.29	3.23	2.85	6.44	2.19
HOV Lanes	Two	Two	Two	Two	Two	Two	Two
Aux Lanes	None	None	None	None	None	Yes	None
TMS Elements							
TMS Elements (BY)	TMS	TMS	TMS	TMS	TMS	TMS	TMS
	RWIS		CMS	CMS	RWIS		CMS
			CCTV	CCTV			CCTV
			RWIS				RWIS
			WIM				
TMS Elements (HY)		CMS			CMS	CMS	
		CCTV			CCTV	CCTV	

SYSTEM CHARACTERISTICS (CONTINUED)									
Segment #	SJ 1	SJ 2	SJ 3	SJ 4	SJ 5	SJ 6	SJ 7	SJ 8	SJ 9
Existing Facility									
Facility Type	Freeway								
General Purpose Lanes	6								
Lane Miles	14.28	20.64	4.98	15.18	32.58	15.66	8.76	9.66	6.3
Centerline Miles	2.38	3.44	0.83	2.53	5.43	2.61	1.46	1.61	1.05
Auxiliary Lanes	None								
20-25 Year Concept Facility									
Facility Type	Freeway								
General Purpose Lanes	8								
Lane Miles	38.08	27.52	6.64	20.24	43.44	20.88	11.68	12.88	8.4
Centerline Miles	2.38	3.44	0.83	2.53	5.43	2.61	1.46	1.61	1.05
Aux Lanes	None	None	None	None	None	None	None	None	None
Post 25 Year Facility									
Facility Type	Freeway								
General Purpose Lanes	6								
Lane Miles	19.04	27.52	6.64	20.24	43.44	20.88	11.68	12.88	8.4
Centerline Miles	2.38	3.44	0.83	2.53	5.43	2.61	1.46	1.61	1.05
HOV Lanes	2								
Aux Lanes	None								
TMS Elements									
TMS Elements (BY)	TMS	TMS	TMS	TMS	TMS	TMS	TMS	TMS	TMS
	CMS		CCTV	CCTV	CMS	CMS	RWIS		CMS
	CCTV				CCTV	CCTV			CCTV
	RWIS				RWIS				RWIS
TMS Elements (HY)		CMS		CMS		RWIS	CMS		
		CCTV		EMS			CCTV		
		RWIS							
		HAR							

SYSTEM CHARACTERISTICS (CONTINUED)					
Segment #	SJ 10	SJ 11	SJ 12	SJ 13	SJ 14
Existing Facility					
Facility Type	Freeway				
General Purpose Lanes	6				
Lane Miles	15.48	39.48	8.82	2.04	28.84
Centerline Miles	2.58	6.58	1.47	0.51	7.21
Auxiliary Lanes	None				
20-25 Year Concept Facility					
Facility Type	Freeway				
General Purpose Lanes	8				
Lane Miles	20.64	52.64	11.76	4.08	57.68
Centerline Miles	2.58	6.58	1.47	0.51	7.21
Aux Lanes	None	None	None	None	None
Post 25 Year Facility					
Facility Type	Freeway				
General Purpose Lanes	6				
Lane Miles	20.64	52.64	11.76	4.08	57.68
Centerline Miles	2.58	6.58	1.47	0.51	7.21
HOV Lanes	Two	Two	Two	Two	Two
Aux Lanes	None				
TMS Elements					
TMS Elements (BY)	TMS	TMS	TMS	TMS	TMS
	CMS	CMS			HAR
	CCTV	CCTV			
	RWIS	RWIS			
TMS Elements (HY)					

Bicycle Facility

Currently, bicycles are not a significant component of the SR 99 corridor. Throughout District 10, SR 99 is a freeway with bicycles and pedestrians prohibited. Although an older freeway, the frontage roads paralleling SR 99 are not continuous particularly in rural settings, do not cross waterways, and thus provide little opportunity for a continuous parallel bicycle facility. Although all three MPOs have plans for active transportation, their current plans integrate bicycle travel with access to transit centers and park and rides, within or outside of the SR 99 corridor.

<table>
<tr><th colspan="9">SR 99 BICYCLE FACILITY</th></tr>
<tr><th rowspan="2">Segment</th><th colspan="3">State Bicycle Facility</th><th colspan="5">Parallel Bicycle Facility</th></tr>
<tr><th>Post Mile</th><th>Location</th><th>Bicycle Access Prohibited</th><th>Parallel Facility</th><th>Seg. ID</th><th>Name</th><th>Location Description</th><th>Facility Type</th></tr>
<tr><td>MER 1</td><td>MER_99_0.00/MER_99_13.86</td><td>Madera County Line to SR 140 east</td><td rowspan="18">Yes</td><td>No</td><td></td><td></td><td></td><td></td></tr>
<tr><td>MER 2</td><td>MER_99_13.86/ MER_99_14.696</td><td>SR 140 east to SR 59 south</td><td>Yes</td><td>2.1</td><td>13th Street</td><td>SR 59 southeast to 'B" Street</td><td>Class III</td></tr>
<tr><td>MER 3</td><td>MER_99_14.69/ MER_99_15.799</td><td>SR 59 south to SR 140 west</td><td>Yes</td><td>3.1</td><td>13th Street</td><td>SR 59 south to SR 140 west/SR 59north</td><td>Class II</td></tr>
<tr><td>MER 4</td><td>MER_99_15.79/ MER_99_16.98</td><td>SR 140 west to 16th Street.</td><td>No</td><td></td><td></td><td></td><td></td></tr>
<tr><td>MER 5</td><td>MER_99_16.98/ MER_99_21.612</td><td>16th St. to East Atwater Boulevard</td><td>No</td><td></td><td></td><td></td><td></td></tr>
<tr><td>MER 6</td><td>MER_99_21.61/ MER_99_23.642</td><td>East Atwater Boulevard. to West Atwater Boulevard</td><td>Yes</td><td>6.1</td><td>Atwater Boulevard</td><td>Applegate Road to Vine Street</td><td>Class II</td></tr>
<tr><td>MER 7</td><td>MER _99_23.64/ MER_99_29.001</td><td>West Atwater Boulevard to Hammatt Avenue</td><td rowspan="10">No</td><td></td><td></td><td></td><td></td></tr>
<tr><td>MER 8</td><td>MER_99_29.00/ MER_99_30.379</td><td>Hammatt Avenue to Winton Road</td><td></td><td></td><td></td><td></td></tr>
<tr><td>MER 9</td><td>MER_99_30.37/ MER_99_37.302</td><td>Winton Road to Stanislaus Countyline</td><td></td><td></td><td></td><td></td></tr>
<tr><td>STA 1</td><td>STA_99_R_0.00/ STA_99_R_1.63</td><td>Merced County Line to SR 165</td><td></td><td></td><td></td><td></td></tr>
<tr><td>STA 2</td><td>STA_99_R_1.63/ STA_99_R_6.75</td><td>SR 165 to Taylor Road</td><td></td><td></td><td></td><td></td></tr>
<tr><td>STA 3</td><td>STA_99_R_6.75/ STA_99_R10.04</td><td>Taylor Road to Mitchell Road</td><td></td><td></td><td></td><td></td></tr>
<tr><td>STA 4</td><td>STA_99_R10.04/ STA 99_R_13.27</td><td>Mitchell Road to Hatch Road</td><td></td><td></td><td></td><td></td></tr>
<tr><td>STA 5</td><td>STA_99_R_13.27/ STA_99_R_16.12</td><td>Hatch Road to Maze Avenue (SR 132)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>STA 6</td><td>STA_99_R_16.12/ STA -99_22.46</td><td>Maze Avenue (SR 132) to Kiernan Road (SR 219)</td><td></td><td></td><td></td><td></td></tr>
<tr><td>STA 7</td><td>STA _-99_22.46/ STA_99_R_24.75</td><td>Kiernan Road (SR 219) to San Joaquin County Line</td><td></td><td></td><td></td><td></td></tr>
<tr><td>SJ 1</td><td>SJ_99_0.00/ SJ_99_2.38</td><td>Stanislaus County Line to Jack Tone Road</td><td>Yes</td><td>SJ 1.1</td><td>South. Parallel Ave/ Frontage Road</td><td>Stanislaus County line to Ripon Road</td><td>Class II</td></tr>
<tr><td>SJ 2</td><td>SJ_99_2.38/ SJ_99_5.82</td><td>Jack Tone Road to SR 120 west</td><td>No</td><td></td><td></td><td></td><td></td></tr>
</table>

SR 99 BICYCLE FACILITY (CONTINUED)								
	State Bicycle Facility			Parallel Bicycle Facility				
Segment	Post Mile	Location	Bicycle Access Prohibited	Parallel Facility	Parallel Facility Present	Seg. ID	Name	Location Description
SJ 3	SJ_99_5.82/ SJ_99_6.65	SR 120 west to SR 120 east						
SJ 4	SJ_99_6.65/ SJ_99_9.18	SR 120 east to Lathrop Road	Yes					
SJ 5	SJ_99_9.18/ SJ_99_14.61	Lathrop Road to Arch Road	Yes					
SJ 6	SJ_99_14.61/ SJ_99_17.22	Arch Road to Golden Gate Drive(SR 4 E)	Yes	No				
SJ 7	SJ_99_17.22/ SJ_99_18.68	Golden Gate Drive (SR 4 east) to SR 4 west	Yes					
SJ 8	SJ_99_18.68/ SJ_99_19.29	SR 4 west to SR 26	Yes					
SJ 9	SJ_99_19.29/ SJ_99_20.34	SR 26 to SR 88	Yes					
SJ 10	SJ_99_20.34/ SJ_99_22.92	SR 88 to Hammer Lane	Yes		SJ 10.	SR 99 Frontage Road	Calaveras River to Hammer Lane	Class II
SJ 11	SJ_99_22.92/ SJ _99_29.50	Hammer Lane to Kettleman Lane (SR 12 W)	Yes	Yes	SJ 11.	SR 99 Frontage Road	Hammer Lane to Bear Creek	Class II
SJ 12	SJ _99_29.50/ SJ_99_30.97	Kettleman Lane (SR 12 west) to Victor Road (SR 12 east)	Yes		SJ 12	Beckman Road	Kettleman Lane to Lodi Avenue	Class II
					SJ 12	Beckman Road	Lodi Avenue to Park and Ride at Victor Road (SR 12 E)	Class III
SJ 13	SJ_99_30.97/ SJ_99_31.58	Victor Road (SR 12 east) to Turner Road	Yes	No				
SJ 14	SJ_99_31.58/ SJ_99_38.79	Turner Road to Sacramento County Line	Yes					

Pedestrian Facility

As a freeway, SR 99 restricts access by pedestrians. Beyond the freeway facility, no continuous pedestrian facility paralleling SR 99 exists. In many communities, freeway overcrossings lack adequate sidewalk widths and disabled ramp access, though most freeway undercrossings possess these features. Local efforts to enhance walkability do not presently concern the SR 99 corridor due to its not being a 'Main Street'. Caltrans' efforts to implement ramp metering on SR 99 may impair or require reengineering of existing pedestrian facilities upon the on-ramps.

PEDESTRIAN FACILITY			
Segment	Post Mile	Location Description	Ped. Access Prohibited
MER 1	MER_99_0.00/ MER_99_13.86	Madera County Line to SR 140 E	Yes
MER 2	MER_99_13.86/MER_99_14.696	SR 140 E to SR 59 S	
MER 3	MER_99_14.69/ MER_99_15.799	SR 59 S to SR 140 W	
MER 4	MER_99_15.79/ MER_99_16.98	SR 140 W to 16th St.	
MER5	MER_99_16.98/MER_99_21.612	16th St. to E Atwater Blvd.	
MER6	MER_99_21.61/ MER_99_23.642	E Atwater Blvd. to W Atwater Blvd.	
MER 7	MER_99_23.64/ MER_99_29.001	W Atwater Blvd. to Hammatt Ave.	
MER 8	MER_99_29.00/ MER_99_30.379	Hammatt Ave. to Winton Rd,	
MER 9	MER_99_30.37/ MER_99_37.302	Winton Rd. to Stanislaus Countyline	
STA 1	STA_99_R_0.00/ STA_99_R_1.63	Merced County Line to SR 165	
STA 2	STA_99_R_1.63/ STA_99_R_6.75	SR 165 to Taylor Road	
STA 3	STA_99_R_6.75/ STA_99_R10.04	Taylor Road to Mitchell Road	
STA 4	STA_99_R10.04/ STA 99_R_13.27	Mitchell Road to Hatch Road	
STA 5	STA 99_R_13.27/ STA_99_R_16.12	Hatch Road to Maze Avenue (SR 132)	
STA 6	STA_99_R_16.12/ STA -99_22.46	Maze Avenue (SR 132) to Kiernan Road (SR 219)	
STA 7	STA _-99_22.46/ STA_99_R_24.75	Kiernan Road (SR 219) to San Joaquin County Line	
SJ 1	SJ_99_0.00/ SJ_99_2.38	Stanislaus County Line to Jack Tone Road	
SJ 2	SJ_99_2.38/ SJ_99_5.82	Jack Tone Road to SR 120 west	
SJ 3	SJ_99_5.82/ SJ_99_6.65	SR 120 west to SR 120 east	
SJ 4	SJ_99_6.65/ SJ_99_9.18	SR 120 east to Lathrop Road	
SJ 5	SJ_99_9.18/ SJ_99_14.61	Lathrop Road to Arch Road	
SJ 6	SJ_99_14.61/ SJ_99_17.22	Arch Road to Golden Gate Drive(SR 4 E)	
SJ 7	SJ_99_17.22/ SJ_99_18.68	Golden Gate Drive (SR 4 east) to SR 4 west	
SJ 8	SJ_99_18.68/ SJ_99_19.29	SR 4 west to SR 26	
SJ 9	SJ_99_19.29/ SJ_99_20.34	SR 26 to SR 88	
SJ 10	SJ_99_20.34/ SJ_99_22.92	SR 88 to Hammer Lane	
SJ 11	SJ_99_22.92/ SJ _99_29.50	Hammer Lane to Kettleman Lane (SR 12 W)	
SJ 12	SJ _99_29.50/ SJ_99_30.97	Kettleman Lane (SR 12 west) to Victor Road (SR 12 east)	
SJ 13	SJ_99_30.97/ SJ_99_31.58	Victor Road (SR 12 east) to Turner Road	
SJ 14	SJ_99_31.58/ SJ_99_38.79	Turner Road to Sacramento County Line	

TRANSIT FACILITY

There are two transit services within the SR 99 corridor-- commuter rail and bus transit. Within District 10, the Amtrak San Joaquin runs between Merced, Denair, Modesto, Stockton, and Lodi; but, while SR 99 follows the Union Pacific Railroad (UP) alignment, Amtrak, and its stations follow the BNSF alignment. Trains run six times a day in both directions (twice a day for Lodi), with both departures and arrivals outside the normal work commute hours.

The Altamont Commuter Express (ACE) has considered expansion of their commuter rail service to Modesto and Merced; and High Speed Rail (HSR) has plans (but no schedule) for a line that runs between Sacramento and Merced where it would then feed into the first stage (proposed completion date 2027) connecting the Bay Area to Southern California. Development of these two endeavors will likely alter the local transit network where stations are proposed. Although future inclusion in the corridor of light rail is desirable, this can only come to the corridor through the sacrifice of existing automobile lanes, or as a subway.

Bus transit service is provided by seven agencies (Chowchilla Transit, Merced County's The Bus, Stanislaus County Rapid Transit (StaRT), Modesto Area Transit (MAX), San Joaquin Rapid Transit (SJRTD) and Sacramento's South County Transit (SCT), and thirteen transit lines employ portions of SR 99, performing mostly as commuter buses. Critical weaknesses include the absence of an interregional bus connection extending from Stockton or Lodi into Stanislaus County; a transit line spanning the entire corridor between Merced and Lodi; and, weekend interregional service. Although the travel time from Merced to Lodi by automobile is approximately one and a half hours, a workday transit commute is not possible. Furthermore, an extra regional bus connection exists northwards into the City of Sacramento, a similar bus connection is unavailable to Fresno. Available park and ride lots in the corridor are the Merced Costco lot, near R Street and SR 99; the Atwater Intermodal Facility near Applegate Road and SR 99; the Sycamore Avenue Park and Ride also near Applegate Road and SR 99 in Atwater; Pedretti Park in Turlock near Monte Vista Avenue and SR 99; the Revival Center near I Street and SR 99 in Modesto; Vintage Faire Mall in Modesto near Standiford Road and SR 99, the Denny's Restaurant near Pelandale and SR 99 in Salida; the Nestle Parking Area near Main Street and SR 99 in Ripon; the new Mariposa Avenue and SR 99 Park and Ride in Stockton; the Morada Road and SR 99 Park and Ride near the Raley's Market in Morada; and, the Victor Road and SR 99 Park and Ride in Lodi. Several of the Park and Ride lots lack a specific transit connection, and all lack bicycle lockers.

In the future there needs to be a shift to heavier use of transit in the SR 99 corridor. First would be the development of interregional commuter service with peak hour headways of less than twenty minutes in both directions, preferably with single stops in Merced, Turlock, Modesto, Manteca, Stockton, and Lodi, and no enroute transfers or transit center waits. At these locations a direct connection to the HOV or managed lanes will be needed. Depending on demand, this service could extend north or southwards to Fresno or Sacramento.

With increasing the availability and extent of the transit service network, there may be no clear role for Park and Ride lots. With ease of access to transit along with the cost associated with owning and operating an automobile, a mode shift away from both single occupancy vehicle commutes and carpooling might arise.[33] Information on commuters that employ these facilities is lacking, and it is unknown whether there is any latent demand given any improvements to security, accessibility to bicycles, or local transit. A study to assess future need should be undertaken by District 10, particularly to see if these facilities have appeal to commuters that lack direct access to local transit services by residing in rural areas outside the transit service network.

[33] See Cartwright, Joe "No, Millennials Aren't Buying More Cars than Gen X" , and "Are Millenials Racing to Buy Cars-- Nope." Streetsblog USA April 22, 2015, and April 25, 2016

TRANSIT FACILITY[34]						
Segment(s)	Mode & Collateral Facility	Name	Route End Points	Headway	Operating Period	Bikes Allowed on Transit
MER 1 through MER 3	Commuter Bus	Chowchilla Transit	Chowchilla to Merced Transpo Center	10 hrs.	Weekday	Yes
MER 4 through STA 2	Commuter Bus	BUS route T	Merced Transit Center to Turlock Transit Center		All Week	
STA 2	Commuter Bus	StaRT 70	Modesto Transit Center to Turlock Transit Center		All Week	
STA 3 through STA 5	Commuter Bus	StaRT 70	Modesto Transit Center to Turlock Transit Center		All Week	
	Commuter Bus	StaRT 10	Modesto Transit Center		Weekday	
	Traditional Bus	StaRT 15	Modesto Transit Center to Turlock Transit Center		Weekday	
STA 6 through SJ 1	Commuter Bus	MAX BART Express	Modesto Transit Center to Pleasanton BART Station		Weekday	
	Commuter Bus	MAX ACE Express9	Modesto Transit Center to Lathrop/ Manteca ACE Station		Weekday	
	Traditional Bus	Blossom Express	Modesto Transit Center to Ripon		T, Th	
SJ 2	Commuter Bus	MAX BART Express	Modesto Transit Center to Pleasanton BART Station		Weekday	
	Commuter Bus	MAX ACE Express	Modesto Transit Center to Lathrop/ Manteca ACE Station		Weekday	
	Traditional Bus	SJ RTD 91	Ripon to Delta College		Weekday	
SJ 3 through SJ 6	None					
SJ 7	Traditional Bus	SJ RTD 91	Ripon to Delta College		Weekday	Yes
SJ 8	Traditional Bus	SJ RTD 91	Ripon to Delta College		Weekday	
	Traditional Bus	SJ RTD 390	Local Route		Weekday	
SJ 9	Traditional Bus	SJ RTD 91	Ripon to Delta College		Weekday	
SJ 10	None					
SJ 11	Traditional Bus	SJ RTD 77	Local Route	1	Weekday	Yes
	Commuter Bus	SJRTD 163	Stockton to Sacramento	1	Weekday	
SJ 12	Traditional Bus	SJ RTD 360	Local Route	1	Weekday	
	Commuter Bus	SJRTD 163	Stockton to Sacramento	1	Weekday	
SJ 13 through SJ 14	Commuter Bus	SCT Highway 99 Express	Lodi Transit to South Sacramento	1	Weekday	
	Commuter Bus	SJRTD 163	Stockton to Sacramento	1	Weekday	

FREIGHT

SR 99 provides an important truck transport corridor allowing freight access to two Class I railroads; several rail yards; two intermodal facilities; several potential cargo airports; numerous truck terminals, warehouses, distribution centers, and break bulk operations. As has been noted, SR 99 follows the old Southern Pacific Railroad mainline (now the UP) from Madera County north to the City of Manteca, and the AL Gilbert railroad siding near Keyes. SR 99 also provides access to the BNSF at the intermodal facility on Austin Road at the eastern edge of Stockton, the Diamond Road rail yard in Stockton, and via Mitchell Road in Ceres and Geer Road in Turlock, the Valley Lift transloading facility in Empire (as well as the Beard's Industrial Tract). Although SR 99 accesses four airports, only the Stockton Municipal Airport and the Modesto City--County Airport currently provide air freight services.

[34] Acronyms: BUS, Merced Transit; StaRT Stanislaus Rapid Transit; MAX, Modesto Area Transit; SJ RTD San Joaquin County Rapid Transit District; SCT South County Transit (Sacramento)

SR 99 is a non-interstate component of the NTN and is part of the Strategic Highway Network. Both designations require all interchanges comply with or be improved to comply with the requirements of STAA. A casual inventory of interchanges along SR 99 indicate the presence of truck terminals or trucking firms accessible from interchanges beginning at Mission Avenue in Merced County, with increased density as the corridor extends northwards into Stockton. An inventory of truck freight facilities will become available with the completion of two current freight studies under the oversight of the San Joaquin Valley MPOs for the I-5 and SR 99 corridors.[35]

Currently within District 10, extensive linear highway corridors permit the location of canals, electric transmission lines, and fuel pipelines, in addition to Class I railroads. In the case of SR 99, a jet fuel pipeline that accessed the old Castle Airforce Base (now the Merced County Castle Airport, the jet fuel pipeline continues further south to military installations in the southern San Joaquin Valley) exists beneath the western shoulder, and a natural gas pipeline can be found beneath the eastern shoulder.

FREIGHT FACILITY					
Facility Type/Freight Generator	**Location**	**Mode**	**Name**	**Major Commodity/ Industry**	**Comments/Issues**
Intermodal Freight Facility	*Arch Road Interchange to Austin Road*	*Truck, Rail*	*BNSF Mariposa Intermodal*	*Electronics, Manufactured Products, Agriculture*	*Lacks current NHS designation on Arch Road east of SR 99*
Rail Yard	*Mariposa Road/Golden Gate I/C*	*Rail*	*BNSF Stockton Rail Yard*	*Agriculture*	*NHS off of Dr. Martin Luther King Jr. Blvd on Diamond Road*
Rail Yard	*Keyes*	*Rail*	*A.L. Gilbert*	*Agriculture*	
Rail Line	*Merced to Manteca*	*Rail*	*UP (Class I)*	*Electronics, Manufactured Products, Agriculture*	*Parallel Facility between Merced to Manteca*
Rail Line	*Golden Gate I/C*	*Rail*	*BNSF (Class I)*	*Electronics, Manufactured Products, Agriculture*	*Crosses SR 99 with overcrossing at Golden Gate Interchange*
Air Cargo Airport	*French Camp Interchange and Arch Road Interchange*	*Airplane*	*Stockton Municipal Airport*	*Agriculture, Air freight (Amazon)*	
Air Cargo Airport	*Mitchell Road*	*Airplane*	*Modesto Airport*	*Mail*	
Freight Generator	*Mitchell Road*	*Truck*	*Beard's Tract*	*Food goods*	*Gallo Winery, Del Monte Cannery*

[35] *San Joaquin Valley Sustainable Goods Movement Action Plan*, and *San Joaquin Valley I-5 Goods Movement Safety Corridor*

ENVIRONMENTAL CONSIDERATIONS

Part of the effort to upgrade and construct transportation facilities is compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Any project undertaken on a highway facility must comply with these two laws, with the result that any environmental impact be avoided, mitigated, or minimized. In the case of expanding highway capacity, often additional right of way needs to be acquired to

<table>
<tr><th colspan="10">ENVIRONMENTAL SCAN</th></tr>
<tr><th rowspan="3">Segment</th><th rowspan="3">Cultural Resources</th><th rowspan="3">Floodplain</th><th rowspan="3">Hazardous Materials</th><th colspan="4">Air Quality</th><th rowspan="3">Waters and Wetlands</th><th rowspan="3">Special Status Species</th></tr>
<tr><th rowspan="2">Ozone</th><th colspan="2">Particulate Matter</th><th rowspan="2">Carbon Monoxide</th></tr>
<tr><th>2.5</th><th>10</th></tr>
<tr><td>MER 1</td><td>High</td><td>Within 100 year flood plain</td><td>Moderate</td><td rowspan="30" colspan="3">Non-attainment</td><td rowspan="30">Unclassified</td><td>Moderate to High</td><td>Moderate to High</td></tr>
<tr><td>MER 2</td><td>Low</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low</td><td>Moderate to High</td></tr>
<tr><td>MER 3</td><td>Low</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low</td><td>Moderate to High</td></tr>
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<tr><td>MER 6</td><td>Low</td><td>None</td><td>Moderate</td><td>Low</td><td>Moderate to High</td></tr>
<tr><td>MER 7</td><td>Low</td><td>None</td><td>Moderate</td><td>Moderate</td><td>Moderate to High</td></tr>
<tr><td>MER 8</td><td>Low</td><td>None</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
<tr><td>MER 9</td><td>Low to Moderate</td><td>None</td><td>Moderate</td><td>Low</td><td>High</td></tr>
<tr><td>STA 1</td><td>Low</td><td>None</td><td>Moderate</td><td>Low</td><td>Low</td></tr>
<tr><td>STA 2</td><td>Low</td><td>None</td><td>Moderate</td><td>Low</td><td>Low</td></tr>
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<tr><td>SJ 1</td><td>Moderate</td><td>Within 100 year flood plain</td><td>Low</td><td>Low to Moderate</td><td>High</td></tr>
<tr><td>SJ 2</td><td>High</td><td>Within 100 year flood plain</td><td>Low</td><td>Low to Moderate</td><td>High</td></tr>
<tr><td>SJ 3</td><td>Low</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low</td><td>Moderate to High</td></tr>
<tr><td>SJ 4</td><td>Moderate</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low</td><td>Moderate to High</td></tr>
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<tr><td>SJ 7</td><td>Moderate</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
<tr><td>SJ 8</td><td>Moderate</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
<tr><td>SJ 9</td><td>Moderate</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
<tr><td>SJ 10</td><td>Moderate</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
<tr><td>SJ 11</td><td>High</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low</td><td>High</td></tr>
<tr><td>SJ 12</td><td>High</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
<tr><td>SJ 13</td><td>High</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
<tr><td>SJ 14</td><td>High</td><td>Within 100 year flood plain</td><td>Moderate</td><td>Low to Moderate</td><td>Moderate to High</td></tr>
</table>

accommodate the expansion or improvement. For SR 99, with the designation of an eight lane concept facility, expansion can be addressed within the existing right of way for most segments, and would avoid significant expenditures of time and money addressing environmental impacts other than noise and air quality. Segments constructed to four lanes without adequate right of way to achieve the eight land concept appear limited to SJ 14.

The affect climate change may have on SR 99 appears minimal—the freeway is above sea level, and possesses some resilience due to having an elevated route with reduced exposure to the anticipated increase in the frequency and intensity of floods. Scour beneath bridges would remain a concern, although this need has been addressed by a bridge monitoring and maintenance system. A flood event would have a substantial impact on the SR 99 corridor as its impact on adjacent towns and approaches could render the corridor inaccessible for emergency response and evacuation. Preparation for events similar to those experienced on SR 99 in Modesto at the time of the New Year's Day Flood of 1997 may be an appropriate model for future planning.

CORRIDOR PERFORMANCE

Current guidance on measuring corridor performance emphasizes employing VMT rather than LOS. At this time no performance measures or standards employing VMT have been formulated. In place of discussing VMT, the federal emphasis on delay has been employed.

Highway performance in the SR 99 corridor tends to have a south to north orientation. Traffic volumes tend to increase northwards, with the exception of freeways within urbanized areas. The pattern reflects the greater population and more extensive urban areas found in the corridor as it extends northward, as well as the two interregional commute patterns towards the Bay Area and Sacramento. AADT ranges from 41,400 in southern Merced County to 71,500 at the Sacramento County line. Commuters encounter peak volumes in Modesto (13,620 AADT) and Stockton (11,600 AADT). Although the share of truck volume to AADT is greatest in portions between Merced County to Turlock, the number of trucks increases south to north from 5,796 AADTT near Madera[36] County to 9,584 AADTT at the Sacramento County line, with peak numbers volumes attained in the urban portion of Modesto and Stockton.

CORRIDOR PERFORMANCE						
Segment #	MER 1	MER 2	MER 3	MER 4	MER 5	MER 6
Basic System Operations						
AADT (BY)	41400	45700	49500	63000	62000	57000
AADT (HY)	64000	69000	75500	103000	98000	96000
VMT (BY)	248400	182800	198000	252000	372000	228000
VMT (HY)	384000	414000	453000	618000	588000	576000
Daily Vehicle Hours of Delay (35 MPH) (BY)	18.6	0	0	5.4	79.2	0.1
Truck Traffic						
Total Average Annual Daily Truck Traffic (AADTT) (BY)	5796	6398	6930	8820	8680	7980
Total Trucks (% of AADT) (BY)[37]	14.0%	14.0%	14.0%	14.0%	14.0%	14.0%
5+ Axle Average Annual Daily Truck Traffic (AADTT) (BY)	4382	4837	4712	5954	5788	6312
5+Axle Trucks (% of AADT) (BY)	10.6%	10.6%	9.5%	9.5%	9.3%	11.1%
Bottlenecks Data						
Bottleneck Existing:	Information unavailable					
Peak Hour Traffic Data						
Peak Period Length	1 hour					
Peak Hour Direction:	South					
Peak Hour Time of Day	1600					
Peak Hour VMT (BY):	24840	18280	19800	25200	37200	22800
Peak Hour VMT (HY):	38400	41400	45300	61800	58800	57600
Peak Hour Avg. Speed (MPH)(BY):	75	67.1	65.3	55.1	55.7	60
Peak Hour Vehicle Hours of Delay (35MPH) (BY)	0.27	0.00	0.00	0.16	<0.00	0.00
Peak Hour Vehicle Hours of Delay (35MPH) (HY)	Information unavailable					

[36] The AADTT for the segment reported in Traffic Census is 10,400 rather than 5,796 obtained by using the 14.0% NHCRP default. This is the highest reported truck volume on SR 99 in District 10, and is considered erroneous on inspection. Values were last verified in 1991.

[37] The 14% for AADT that are trucks employed in Merced County represents the NHCRP default value, rather than the value published in the 2015 Traffic Census. This reflects uncertainty regarding these values by the District, and should not be extrapolated in regards to District 6.

CORRIDOR PERFORMANCE (CONTINUED)						
Segment #	MER 7	MER 8	MER 9	STA 1	STA 2	STA 3
Basic System Operations						
AADT (BY)	63000	65000	65000	64475	77250	94860
AADT (HY)	111000	116000	116000	116325	140500	158450
VMT (BY)	378000	390000	260000	189610	719360	521301
VMT (HY)	666000	696000	696000	309064	3683123	1715079
Daily Vehicle Hours of Delay (35 MPH) (BY)	0	0.0	5.3	0	0	<0
Truck Traffic						
Total Average Annual Daily Truck Traffic (AADTT) (BY)	8820	9100	9100	15861	19004	11772
Total Trucks (% of AADT) (BY)	14.0%	14.0%	14.0%	24.6%	24.6%	12.4%
5+ Axle Average Annual Daily Truck Traffic (AADTT) (BY)	5800	5984	5779	10706	12827	7946
5+Axle Trucks (% of AADT) (BY)	9.2%	9.2%	8.9%	16.6%	16.6%	8.4%
Bottlenecks Data						
Bottleneck Existing:	Information unavailable					
Peak Hour Traffic Data						
Peak Period Length	1 hour					
Peak Hour Direction:	South					
Peak Hour Time of Day	1600				1700	
Peak Hour VMT (BY):	37800	39000	26000	9983	35600	28089
Peak Hour VMT (HY):	66600	69600	69600	18020	64757	46924
Peak Hour Avg. Speed (MPH)(BY):	68.5	57.3	61.7	65.2	69.7	69.0
Peak Hour Vehicle Hours of Delay (35MPH) (BY)	0.00	0.00	0.21	0.00	0.07	0.00
Peak Hour Vehicle Hours of Delay (35MPH) (HY)	Information unavailable					

CORRIDOR PERFORMANCE (CONTINUED)						
Segment #	STA 4	STA 5	STA 6	STA 7	SJ 1	SJ 2
Basic System Operations						
AADT (BY)	106660	122675	136260	126725	126725	121630
AADT (HY)	182660	221200	265525	260000	259900	253400
VMT (BY)	589992	630420	1709981	569400	1809633	2510443.2
VMT (HY)	1905674	1796697	11012278	1246986	4948496	6973568
Daily Vehicle Hours of Delay (35 MPH) (BY)	33.6	<0	108.4	42.4	24.6	92.8
Truck Traffic						
Total Average Annual Daily Truck Traffic (AADTT) (BY)	13354	14782	18395	17108	17108	16420
Total Trucks (% of AADT) (BY)	12.5%	12.1%	13.5%	13.5%	13.5%	13.5%
5+ Axle Average Annual Daily Truck Traffic (AADTT) (BY)	9014	9978	12417	11548	10778	10345
5+Axle Trucks (% of AADT) (BY)	8.5%	8.1%	9.1%	9.1%	8.5%	8.5%
Bottlenecks Data						
Bottleneck Existing:	Information unavailable					
Peak Hour Traffic Data						
Peak Period Length	1 hour					
Peak Hour Direction:	South					
Peak Hour Time of Day	1600					1500
Peak Hour VMT (BY):	31006	31466	78977	24978	14930	20712
Peak Hour VMT (HY):	53100	56737	153896	51218	30614	43151
Peak Hour Avg. Speed (mph)(BY):	65.4	61.4	54.2	47.1	52.7	52.7
Peak Hour Vehicle Hours of Delay (35 MPH) (BY)	3.83	<0.00	16.18	4.47	2.02	6.57
Peak Hour Vehicle Hours of Delay (35 MPH) (HY)	Information unavailable					

CORRIDOR PERFORMANCE (CONTINUED						
Segment #	SJ 3	SJ 4	SJ 5	SJ 6	SJ 7	SJ 8
Basic System Operations						
AADT (BY)	93280	70550	74650	85000	109750	107050
AADT (HY)	183000	125100	132300	158600	21800	116150
VMT (BY)	464534.4	1070949	2432097	1331100	961410	1034103
VMT (HY)	1215120	2532024	5747112	3311568	254624	2592100
Daily Vehicle Hours of Delay (35 MPH) (BY)	4.5	6.9	37.5	190.6	0	0
Truck Traffic						
Total Average Annual Daily Truck Traffic (AADTT) (BY)	12593	10448	11571	11356	14487	14131
Total Trucks (% of AADT) (BY)	13.5%	14.8%	15.5%	13.4%	13.2%	13.2%
5+ Axle Average Annual Daily Truck Traffic (AADTT) (BY)	7933	6583	5704	9801	8402	8196
5+Axle Trucks (as% of AADT) (BY)	8.5%	9.3%	7.6%	7.7%	7.7%	7.7%
Bottlenecks Data						
Bottleneck Existing:	Information unavailable					
Peak Hour Traffic Data						
Peak Period Length	1 hour					
Peak Hour Direction:	South					
Peak Hour Time of Day	1600		1600			
Peak Hour VMT (BY):	3833	8835	20064	10983	7931	8531
Peak Hour VMT (HY):	7521	15666	35556	20494	15753	16039
Peak Hour Avg. Speed (mph)(BY):	55.3	66.1	69.7	69.4	52.3	61.7
Peak Hour Vehicle Hours of Delay (35mph) (BY)	1.18	0.99	3.88	21.03	0.00	0.00
Peak Hour Vehicle Hours of Delay (35mph) (HY)	Information unavailable					

CORRIDOR PERFORMANCE (CONTINUED)						
Segment #	SJ 9	SJ 10	SJ 11	SJ 12	SJ 13	SJ 14
Basic System Operations						
AADT (BY)	116150	93000	77250	72700	73800	71525
AADT (HY)	214400	162750	140300	135200	142300	125000
VMT (BY)	731745	1439640	3049830	641214	150552	2062781
VMT (HY)	1800960	3359160	7385392	1589952	580584	5407500
Daily Vehicle Hours of Delay (35 MPH) (BY)	16.7	1.7	179.8	0	0.1	5.0
Truck Traffic						
Total Average Annual Daily Truck Traffic (AADTT) (BY)	15448	12369	10274	9742	9889	9584
Total Trucks (% of AADT) (BY)	13.3%	13.3%	13.3%	13.4%	13.4%	13.4%
5+ Axle Average Annual Daily Truck Traffic (AADTT) (BY)	8960	7174	5959	5650	5521	5351
5+Axle Trucks (as% of AADT) (BY)	7.7%	7.7%	7.7%	7.8%	7.5%	7.5%
Bottlenecks Data						
Bottleneck Existing:	Information unavailable					
Peak Hour Traffic Data						
Peak Period Length	1 hour					
Peak Hour Direction:	South				North	
Peak Hour Time of Day	1600		0700		1600	
Peak Hour VMT (BY):	6038	11876	25162	5289	1863	25531
Peak Hour VMT (HY):	11146	37797	45705	9839	3592	44601
Peak Hour Avg. Speed (mph)(BY):	57.9	66.1	69.1	60.9	60.3	61.6
Peak Hour Vehicle Hours of Delay (35mph) (BY)	0.85	0.02	0.72	0.00	0.01	0.74
Peak Hour Vehicle Hours of Delay (35mph) (HY)	Information unavailable					

The higher volume of congestion in Modesto (population 201,161) compared to Stockton (population 315,592) likely reflects the relative lack of access to fewer freeways and expressways for travel in Stanislaus County urban areas compared to those in San Joaquin County. For Modesto, this is due in part to the constraint of bridging the Stanislaus River--only four bridge crossings exist from SR 99 east to SR 120 into Oakdale. A second north to south expressway or freeway along the eastern limit of Modesto might attenuate traffic volumes on SR 99 in Stanislaus County, particularly if connected to SR 120 to the north.

There are three general factors that influence freeway performance and can be reflected in travelers experiencing increased travel delay:

1. Geometrics—straight highways help to maintain a constant and even rate of speed where highways with changes in the horizontal and vertical direction do not;

2. Capacity--the available number of travel lanes and interchange spacing permit efficient travel and merging; and,

3. Demand--if the number of users does not exceed the capacity, it will perform at its concept LOS, if they do exceed the capacity of the highway, then the highway will not perform at its concept LOS.

Having a highway with suboptimal geometrics, capacity, and demand will be reflected in higher rates of delay. Though issues with geometrics and capacity are organic to a highway's design (which in turn may be reflected by differences in the distribution of accident rates along a corridor), demand is not. At present, additional investment into improving geometrics or increasing capacity are considered less cost efficient than demand management. Currently ramp metering is considered the more cost efficient means of managing traffic flow and delay, and is a substantial portion of the District's short term strategy to reduce delay on SR 99.

The standard for measurement of delay is the frequency travelers experience travel at a rate of 35 MPH or less. However, the values given for delay should not be considered the total aggregate of delay one might experience traveling on a freeway with posted speed limits of 55 to 70 MPH.

In managing for locations with higher than expected rates of daily delay, there remains a need to further review how geometrics and capacity actually interact with driver delay.

For the most part, SR 99 in District 10 is constructed upon the level flood plain of the San Joaquin and Sacramento River system. Geometrics appear to only play a role in past engineering decisions on whether the freeway would be an overpass or an underpass, and where the freeway comes into proximity with a watercourse. Places where geometrics come into play with the potential to increase traveler delay are at the two ends of the City of Merced (MER 2, MER 3, and MER 4); near the City of Livingston at the Merced River (MER 8); the City of Modesto between Ninth Avenue up to the Carpenter Road interchange over the Tuolumne River (STA 5 and STA 6); Stockton between Cherokee Road and Hammer Lane, over the Calaveras River (SJ 10); and the crossing of the river bed complex of Dry Creek and Mokelumne River near the San Joaquin and Sacramento County line (SJ 14). Cursory review of where elevated levels of delay occur, shows little correlation between locations with geometrical issues on SR 99 with travelers experiencing excessive delay for 2016 with the possible exception of the segments in downtown Modesto (STA 5 and STA 6).

The capacity of SR 99 varies from four to six lanes, not including the few auxiliary lanes on the facility. SR 99 is a six lane facility in rural portions of Merced County, and from Turlock north to the southern city limits of Lodi. In all other locations it is four lanes. Available right of way constrains capacity expansion to eight lanes. The spacing of interchanges conforms to past design criteria reflecting construction of the freeway facility in the 1950's and 1960's. Efforts to address the reduced capacity affiliated with weaving between closely spaced interchanges with high traffic volumes are limited to either installation of auxiliary lanes as is the case with the Kiernan Lane and Pelandale Road interchange and auxiliary lane projects; or with the replacement of existing interchanges with new interchanges farther apart such as was done with the South Stockton Widening Project with the replacement of the Main Street and SR 4 East interchanges with the new interchange at Golden Gate Avenue.[38] Again, in looking at the distribution of where excessive delay has occurred, there appears little correlation between reported delay and whether a facility is four or six lanes.

Interplay between the factors of highway geometrics and capacity may influence the rate at which accidents occur. Locations with high accident rates may experience higher traveler delay than elsewhere. However, a vigilant highway safety program with prompt implementation of improvements should attenuate delay at those locations. At present there are only three projects addressing safety on SR 99 that are planned or programmed.

Measurement of performance and delay is obtained through automated traffic count stations located throughout the corridor, and with select stations linked up and integrated into a real time tabulation system known as the Performance Measurement System (PeMS), as well as centralized information processors affiliated with traffic management system and traffic incident management. Traffic Monitoring Stations (TMS), linked up to lane specific detector loops, tabulate the number of vehicles passing over, once calibrated to traffic conditions, for the period of time counting is undertaken.

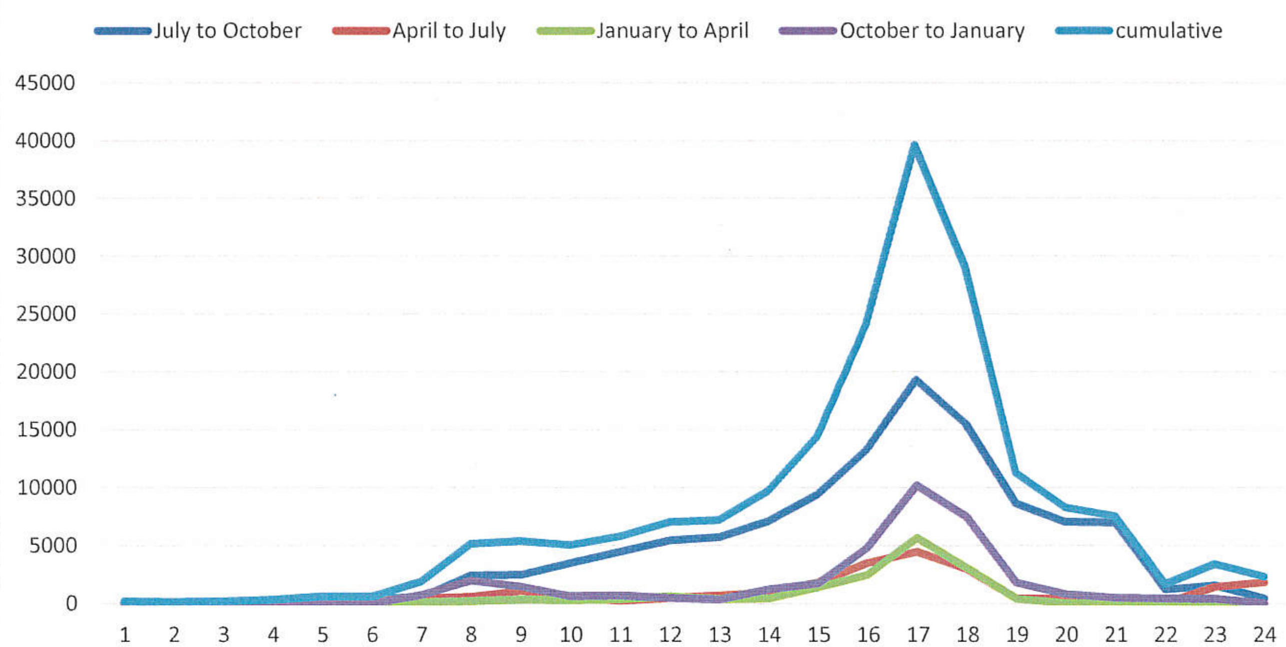
[38] The South Stockton Widening project also includes an auxiliary lane on the southbound segment between the SR 4 West interchange southbound to the Golden Gate Avenue interchange.

Data on delay for SR 99 was collected for a full year starting in October 2015 and ending in October 2016. The values obtained were tabulated to characterize the temporal and spatial distribution of delay. These are expressed in the graphs provided below.

Mapping and characterizing the extent of delay on SR 99 is problematic. One weakness in the system is that with detectors along SR 99, there is no consistent tabulation of delay as one count station may have daily counts with sufficient detection, while an adjacent station may not. Secondly, the northbound lanes report a larger total aggregate of delay compared to southbound—this is reflected in the vertical axes being in different scales for the two graphs. Lastly, for the year surveyed, there was the matter of new stations coming on line, possibly reporting before calibration. This appears to have been the case with segment SJ 11, all of the delay reported is obtained in one three month period from a new detector located north of the Hammer Lane interchange in the northbound direction. The segment has no obvious operational or temporary conditions to cause the reported delay. When the delay reported from that station is deducted from the total delay for the segment, there is no indication of any delay at all.

Fig. 1 and 2 display delay distributed throughout the day. The amount of delay is not equally distributed in both directions, with a far greater amount of delay reported for the northbound commute. The pattern is not evenly distributed throughout the day but corresponds to some degree to typical work commute volumes. In both Figures, however, no morning pattern of elevated driver delay coinciding with the AM peak hour was noted, but there was a strong pattern of delay in the afternoon that corresponded to the PM peak hour.

Figure 1: Northbound Hourly Delay SR 99



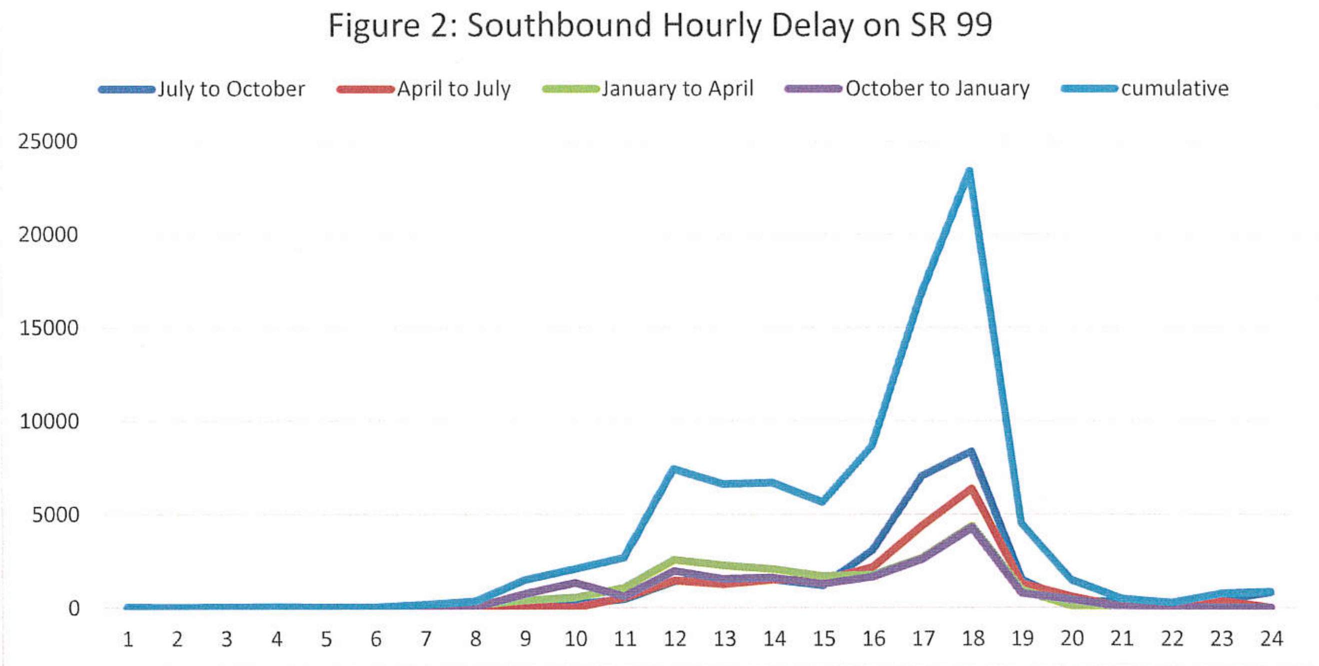


Fig. 3 and 4 display the distribution of delay by post mile. Between Madera and Sacramento Counties delay on SR 99 is not distributed uniformly. Because delay is measured in both directions, the locations of detectors on northbound SR 99 do not coincide with those on southbound SR 99. Two peaks reporting levels of delay exceeding 600,000 annual hours of delay occurred on the northbound 99, while the largest peaks, exceeded 14,000 annual hours of delay, occurred on southbound SR 99. With one exception, spikes in delay do not appear to coincide spatially, this would seem to suggest that demand does not drive locations with high delay, leaving either geometrics, capacity changes, construction zones, or locations with a repeated history of accidents as the potential cause(s). Lane closures typically occur at night between the hours of 9 PM to 5 AM, period for which little delay is evident based upon the hourly tables, and are not likely to be factors. Accidents or vehicle breakdowns might be a factor, but locations with repeated accidents would come up on the TASAs database, leading to a proposal for a safety project. Aside from a facility wide rumble strip project, there are only three safety projects related to the SR 99 mainline. One is a proposed median barrier gap reduction at PM SJ 5.33/5.65 (located south of Manteca); the second involves the removal and relocation of potential signpost obstructions at various locations; and the third involves the extension of deceleration lanes at the Beckwith and Carpenter Roads Interchange at PM STA 99 R18.1/R20.9. Of these three, only the median barrier project occurs in a location of reported elevated delay (the STA 99 project lacks detection).

Northbound SR 99 shows two huge peaks in San Joaquin County at Arch Road and near Hammer Lane with echoes both down and upstream from the detector. What the peak at Arch Road appears to indicate is a transition from six to four lanes that occurred a lane drop in the fast lane which has been corrected for with the completion of the South Stockton Widening. The station north of Hammer Lane is discussed above, and is considered erroneous.

Figure 3: Northbound Delay on SR 99 (10/2015 to 10/2016)

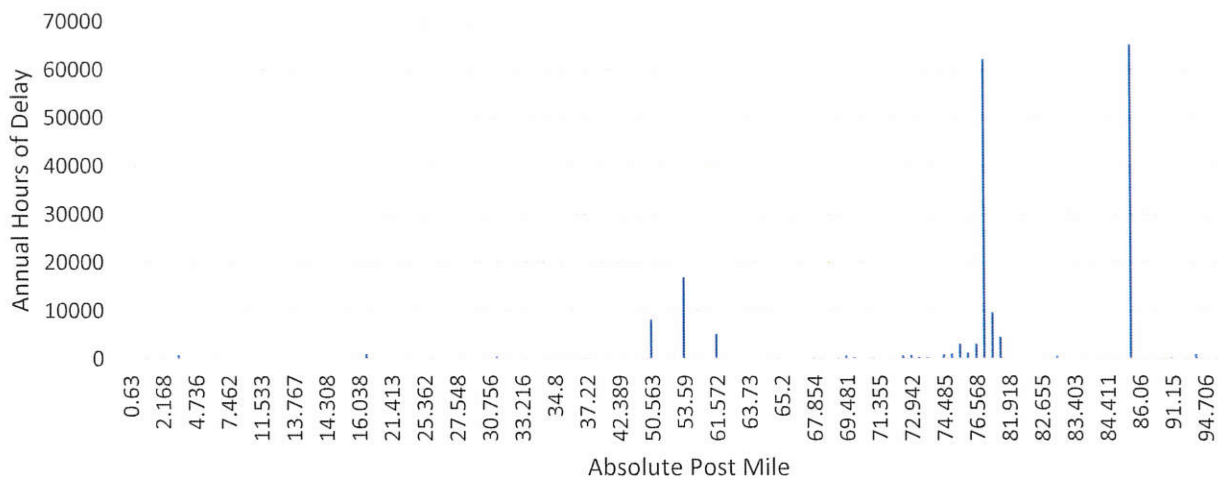
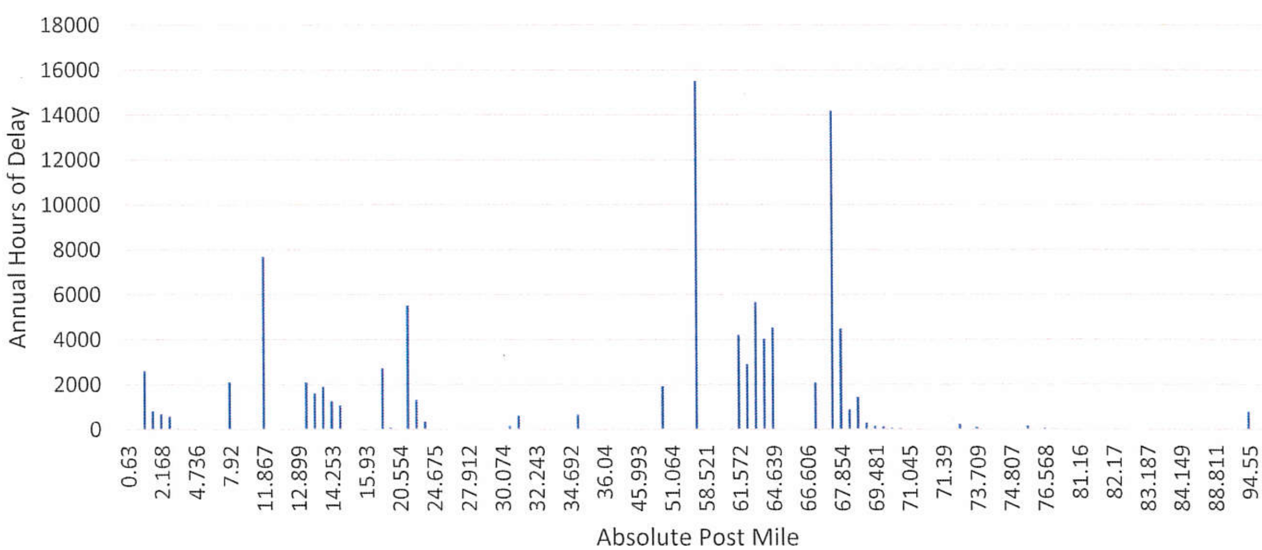


Figure 4: Southbound Delay SR 99 (10/2015 to 10/2016)



Southbound SR 99 shows two major peaks in accumulated delay, one at Maze Boulevard (SR 132), and the other just south of the merge of SR 99 with SR 120. The possible factor contributing to the delay reported at Maze Avenue (SR 132) is unclear although there is a second, close by, off ramp at 'I' Street (but without any intervening off-ramp). The detector is isolated from other detectors unlike at the SR 99 and SR 120 merge, and there do not appear to be any lane or interchange factors influencing the condition. As approximately 16% of the delay reported at the location occurs during the peak hours, it is assumed the delay is affiliated with the arrival and departure of workers to downtown Modesto where both city and county governments are located.[39] At the SR 99 and SR 120 merge, there is a lane drop in the fast lane (there is also a lane drop in the northbound direction but there is no indication of any delay in the graph).

[39] It had been suggested that the delay might be associated with interregional commute to the Bay Area on SR 132. The reported peak hour of 0700 to 0800 and 1600 to 1700 suggests this might not be the case, given its influence would be more strongly felt earlier in the morning and later in the afternoon.

Conditions governing the distribution of daily and peak hour delay are not clear. Generally there are two expectations: locations with elevated values of daily delay would be expected to have higher values of delay in the peak hour; and segments with the highest daily traffic volumes would experience the greatest delay, everything else being equal. Neither expectation is borne out by the data. There appears to be some correlation between daily delay and merging traffic or with a reduction in number of lanes, but the segment hypothetically expected to experience the greatest amount of delay, SJ 2, where SR 120 west merges into SR 99 south does not show this issue, compared to segments SJ 6 and SJ 11 which have lower volumes.

In evaluating the significance of delay, the amount of delay measured for a segment was divided by the total AADT. In the case of segments with large volumes of delay, the average amount of delay was on the order of seconds, and well within a margin of error given the precision and accuracy of the measurement at the count station. Reliability, or the variance in the extent of delay over time, was not measured.

At the time of development of this TCR, capacity expansion on SR 99 had been underway in all three counties. This has had two effects on evaluating system performance—lane widening can offset detector loops, altering the count detection of vehicle passes and their rate; and traffic in the construction zone moves at a slower rate.

In assessing the daily vehicle hours of delay there is little means to discriminate if the delay is due to permanent or temporary conditions. Temporary conditions such as construction delays or the uncalibrated data from a new count stations appear relevant to conditions of delay on the north bound SR 99. All of the delay measured on segment SJ 11 is obtained from a new count station installed in the most recent three month period of the 2015 to 2016 year with the rest correlated to construction projects in south Stockton and near Lodi. However, patterns on southbound SR 99 appear to accord with permanent conditions, particularly the lane drop at the merge of SR 120 east and SR 99 just south of Manteca. What brings the reported delay on the SR 99 into question as to its accuracy is the lack of reported delay in the AM peak hour period.

Throughout this TCR, recommendations have been made to address demand management on SR 99. The intent behind demand management strategies are to alleviate the affect delay might have upon travel time with the goal being the formation of a more reliable travel time. However, the delay currently being reported for the corridor appears minor. The daily amount of delay for an individual vehicle measured possesses a magnitude of seconds, and falls within the range of measurement error.

Currently, ramp meters, the preferred demand management strategy, have been constructed on SR 99 in San Joaquin County between Austin Road and Hammer Lane, with a second project to install ramp meters between Pelandale Road in Modesto and SR 120 east (Yosemite Avenue) having been programmed.[40]

A ramp metering network between Turlock and Lodi should be operational by the HY of 2040 given the current network of installed and projects to install ramp meters on SR 99. The schedule for installation south of Pelandale Road is uncertain—there are no indications of candidate projects in the current Status of Projects (SOP). Earlier ramp metering plans identified three levels of priority with years to implementation without identifying a base year for implementation to start from. The current plan only identifies high priority, again without a base year. In the earlier plans, ramp metering was to be operating on SR 99 from the intersection with SR 120 west north to Hammer Lane within five to ten years; from Hammer Lane south to Arch Road, from SR 120 west and Mitchell Road in both directions, and between Mission Avenue and 'R' Street in both directions within ten to twenty years; and from Arch Road south to SR 120 west after twenty years. The current plan places the higher priority on urban ramp meters in San Joaquin County between Main Street in Ripon and SR 12 east (Victor Road) Lodi, with lower priority given rural interchanges in San Joaquin County, all interchanges throughout Stanislaus County, and three north bound ramps on interchanges in Merced County between 'V' Street and Franklin Road.[41]

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[40] SOP September 2016

[41] Ramp Metering Development Plan (2013), pp 124-131.

In conclusion, there appears to be systemic issues with how delay is reported for the corridor. Overall, most detectors show a high spatial variability and inconsistency in measurement. There seems to be indications of false positives, and insufficient saturation of detection to allow better measurement of the extent and duration of delay through the day (e.g. the spacing of active detectors needs to be much closer).

CSMP Updates

The CSMP remains a California Transportation Commission (CTC) requirement for the use of the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 (Prop 1B). The purpose of the CSMP is to reduce congestion, improve safety, and to preserve the mobility gains of the Proposition IB investments. Five capital improvement projects on SR 99 in District 10 were funded by Prop 1B. These were documented in three CSMPs broken down by the three MPOs (conceptually in the absence of logical termini, these could have either been one report, or reduced in scope and intent to the portion of the corridor directly affected by the improvement)[42]. They were the combined Arboleda and Plainsburg Interchange Project in Merced County, the Kiernan Interchange Project (along with projects to upgrade the Pelandale Interchange, and construct auxiliary lanes between the two) in Stanislaus County, and the South Stockton and Manteca Widening Projects in San Joaquin County. All three are completing construction, and future TCRs will document the progress made with preserving the congestion and operational improvement each offers by employing performance measures. The following discussion describes the projects and inventories the status of projects identified in the CSMP furthering each project's resilience and sustainability.

The CSMP is intended to assist in managing and operating a transportation corridor with the highest sustainable productivity and reliability based upon real time feedback provided by evaluating and assessing performance measures. This would reflect two endeavors. The first was to develop an integrated highway monitoring system that deploys ITS, with recordation available through the PeMS network. Much of the effort in providing previous CSMPs were applied in characterizing this effort. The second was to develop operational improvements to preserve or further reduce traffic congestion, reduce collisions, fatalities, and injuries, improve reliability, and reduce delay over capacity increasing projects. Although the previous CSMPs enumerated planned and programmed projects in the various corridors addressed, a connection between the proposed improvement and achieving the CSMP's goals could not be assessed due to the Prop 1B projects not yet being in place. The ultimate goal is achieve the best return on investment by providing projects with the greatest cost to benefit ratio.

For the SR 99 corridor, the CSMP documents were completed before guidance or facilities to attain the goals of the CSMP process were in place. A key factor was that an adequate Transportation Monitoring System was not in place to assess initial conditions in the corridor(s). With the exception of San Joaquin County, much of the ITS elements in the SR 99 corridor were awaiting installation (either programmed or planned). Without means to monitor the development of bottlenecks in the corridor, design of simulations and traffic models could not adequately assess initial system conditions as to delay and reliability. Further, it could not assure that modeled segments did not avoid having bottlenecks included at the start or end of the segment—as appears to be the case with the San Joaquin section extending from the SR 120 west Interchange up to the Sacramento County line. Initial conditions will need to be characterized following opening day for all improvements, which will require analysis in a later TCR. Only then can the spirit and intent of the California Transportation Commission's requirements for CSMPs be met.

The Plainsburg Interchange and the Arboleda Interchange and SR 99 Widening Projects: The need for the two interchanges south of Merced follows from the effort to close at grade street crossings, and upgrade the portion

[42] The Arboleda Road and Plainsberg Road Interchanges CSMP does address SR 99 north of SR 152 in Madera County, and includes that MPO.

of SR 99 from expressway to freeway. In addition, the number of lanes was increased from four to six. The effort reflects the second level of improvements to SR 99 identified by its designation as a Focus and High Emphasis Route, in that the facility be upgraded throughout to freeway, in the ITSP (1993). For the county of Merced, the project, with the exception of the four lane segment north of Delhi, contributes to the effort to upgrade the rural portions of SR 99 to six lane freeway, leaving the urban four lane segments in Merced and Atwater for later widening or upgrade.

Land uses along the corridor include agriculture with a scattering of rural residences in proximity to SR 99. Future changes to land use are not anticipated. Lacking the local commuter density found in urban areas, congestion management and demand management strategies are not considered a priority in this corridor, but infrastructure providing for real time incident management may be a concern.

The minimal investment in the corridor would be for an ITS network that would integrate CMS sufficiently north and south of an incident in the corridor to allow rerouting of traffic onto State Highways. Although parallel routes to SR 99 are available eastward on Plainsburg Road and Arboleda Road from SR 99 to SR 140, and back to SR 99, the favored scenario would involve rerouting truck traffic to I-5 via SR 152 in the south, and SR 140 to the north (automobile traffic may be routed via SR 59 to SR 152 rather than I-5, avoiding SR 140), although interdiction of traffic farther north and south may be desired. Such efforts require cooperation and coordination between Districts 6 and 10.

Although the scenario mentioned above is not discussed in the CSMP, tables of Programmed ITS elements for the SR 99 corridor are provided that suggest this was part of the overall intended strategy. Four CMS with associated Traffic Monitoring Stations (TMS) and Closed Circuit Televisions (CCTV), and two Roadside Weather Information Stations (RWIS) were constructed with the Arboleda and Plainsburg projects. Extension of the ITS system northwards was to be addressed by a separate project—the Merced Monitoring Stations (EA 10-0E720-) to install a network of TMS on I-5 (28), SR 59 (2), SR 99 (63), SR 140 (2), and SR 152 (6).[43] At this time the project has been constructed, and is in the process of being closed out.

The Kiernan Interchange Project: The need was to address a bottleneck that formed in proximity to the Kiernan and Pelandale Interchanges on SR 99. The bottleneck was associated with two factors, inadequate vehicle storage on access ramps, and the short spacing between interchanges producing weaving. Expansion of the ramps on both ramps to two lanes, and introduction of the auxiliary lanes are expected to improve operations on SR 99. The project addresses widening a portion of SR 219 between the interchange and Dale Road to six lanes, and to bring the height of the overpass up to current design standards.

Land uses along the corridor include immediate access to commercial services, with residential areas set away from the corridor and with two medical facilities in proximity. Future intensification of commercial development might be expected along Kiernan Road, with increased residential development further east of the Kiernan Interchange with the expansion of the Cities of Modesto's and Riverbank's city limits, along with possible residential growth to the west near Salida. Congestion management and traffic demand management remain high priorities, along with projects that anticipate development of newer bottlenecks and other operational issues with the improved flow on the segment.

Ongoing investment in the corridor will require expansion of ITS services to better real time traffic information, and to monitor future development of congestion issues. Ramp metering will continue to be an option for traffic demand management, with the additional possibility of redirecting traffic with CMS during high volume shopping seasons (December has the third to fourth highest traffic volumes for all months for SR 99).

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[43] It is not clear if Bond monies funded this project.

The South Stockton Widening and the Manteca Widening Projects: The need was to address congestion and two bottlenecks on SR 99 by expanding the facility to six lanes, along with installing two auxiliary lanes one south of Arch Road, and the other south of SR 120 west to Austin Road. This included the reconstruction of several Interchanges (Main Street, Farmington Road, Mariposa Road, French Camp Road, Lathrop Road, and the replacement of two by one (the Main Street Interchange and the Farmington Road Interchange with the new Golden Gate interchange) to create interchange spacing in conformity with the current Highway Design Manual, and reduce the bottlenecks and weaving.

Urban land uses along the corridor include residential housing, commercial, and industrial land uses from three separate general plans. Rural land uses include rural residential and farming. Future infill of lower density land uses, and development of agricultural land near the corridor suggest continued growth in traffic demand and access to the corridor. Congestion management and traffic demand management are the highest post construction priorities to implement.

Ongoing investment in the corridor will need to include continuing investment in ITS services to obtain real time traffic information.

KEY CORRIDOR ISSUES

- Lack of available right of way will constrain corridor expansion. From a highway centric perspective this will limit the freeway to eight lanes. Whether these will be multi-use or auxiliary lanes is unclear, and possibly limit the opportunity for corridor specific special use lanes for transit, light rail, or freight.

- Mid segment reductions in lane number (lane drop) increased travel delay. In many locations this involves the number 1 lane having to merge into the number 2 lane (Segments MER 9, SJ 2, SJ 5, and SJ 11). Many of these lane reductions were eliminated with projects expanding capacity from four to six lanes, but were still present in the dataset to assess system delay.

- Self-help funding has expanded into Stanislaus and Merced Counties. Local expenditures on commute corridors will likely expand. The potential for the SR 99 corridor to be constructed to an eight lane facility with HOV lanes by 2040 has improved.

- Future HOV and related managed lanes will need opportunity to provide direct connections for transit.

- Traffic Demand Management will be implemented on SR 99 with ramp metering for San Joaquin County south of Hammer Lane, and the portion in Stanislaus County north of Pelandale Road. Extension of ramp metering program farther south on SR 99 into Stanislaus and Merced Counties is anticipated prior to 2040.

- Improved monitoring and measurement of delay needs to be in place before implementing a traffic management system for the corridor. The reported delay for 2016 appears to underestimate the amount of time spent traveling by individuals in the SR 99 corridor.

- Development of active transportation improvements along the corridor are hindered by restricted access of pedestrians and bicycles to the freeway facility. The lack of a system of frontage roads in rural areas, along with gaps due to the absence of bridges at river crossings, preclude the corridor being employed for interregional use.

- Linkage of local bicycle and pedestrian routes to park and ride lots or transit centers that serve interregional travel will need additional agency support. A number of park and ride lots along the corridor lack transit connections, and visual surveys do not indicate heavy use. The future of park and ride lots on the corridor assisting in a future mode shift is ambiguous.

- Greater investment in transit services in the corridor is needed. Daily interregional express commuter buses running between Merced and Lodi with stops at major cities along SR 99 with peak hour headways of twenty minutes or less, or light rail along the corridor as a parallel facility or subway with a similar schedule should be provided.

- Both the *San Joaquin Valley Sustainable Goods Movement Action Plan*, and *San Joaquin Valley I-5 Goods Movement Safety Corridor* are in development. Issues related to goods movement will be addressed in a later TCR where the two reports' findings can be discussed.

CORRIDOR CONCEPT

CONCEPT RATIONALE

The central purpose of a TCR is to report on the future direction of planning strategies in order to optimize interregional travel within a highway corridor for District 10. This purpose is often expressed as 'need'. Caltrans currently emphasizes a planning approach that focuses upon sustaining and maintaining corridors, and less upon capacity expansion in light of concerns about the availability of future funding. Discussion of maintenance projects such as pavement rehabilitation, and design upgrades unrelated to system expansion are generally excluded from the TCR for this reason. In light of past planning goals for SR 99 this approach appears to be at odds with the strategy for SR 99 to serve as a part of the IRRS, as the goal was to upgrade the facility to an eight lane facility. The limited available right of way in District 10 prevents the development of a facility with greater capacity, and will retain a future facility within the Caltrans' current vision for the SHS.

The concept rationale for SR 99 is an eight lane freeway from the City of Merced to the Sacramento County line, and a six lane freeway from the City of Merced south. Conversion of two lanes to HOV is a consideration in the post twenty five year concept but was not assessed in this TCR. Operational issues within the corridor rest on increased traffic demand which the District intends to manage though implementation of a ramp metering program. At this time, the infrastructure to support ramp metering is in place in San Joaquin County. The District is currently considering implementation of an Integrated Corridor Management system, but preliminary discussions are considering corridors other than SR 99.

Caltrans has endorsed the strategies of Smart Growth, Context Sensitive Solutions (CSS), and Complete Streets, which attend to local interests and vision to improve their communities. These strategies do not appear to fit with an interregional freeway facility with limited right of way for the improvements these approaches may call for. Within the context of Smart Growth, opportunities to enhance transit use in the corridor rely upon expanding existing park and ride facilities and providing direct transit access to managed lanes. Effort might be applied to examining the feasibility of a subway transit service extending the length of the corridor. In addressing CSS, the approach best addresses expressways and conventional highways rather than freeways. With SR 99, an appropriate CSS approach would involve strategies that bypass the freeway, and support local enhancements to streets, commercial areas, and walkable and rideable corridors. Given that freeways typically restrict access of bicycles and pedestrians for safety reasons, a multimodal complete streets approach within that corridor appears questionable except when considering transit.

In the 2016 general election, both Stanislaus and Merced Counties passed "self help" sales tax increases to fund transportation improvements. With this supplemental funding source, changes to the number, extent, and viability of projects on SR 99 will likely change.

PLANNED AND PROGRAMMED PROJECTS AND STRATEGIES

Seg.	Description	Location	Source[44]	Purpose	Implementation Phase
MER 1	None needed at this time (fulfills concept)				
MER 2	Widen to six lanes	Segment wide	RTP	Capacity	Planned
MER 3	Widen to six lanes	Segment wide	RTP	Capacity	Planned
MER 4	Widen to six lanes	Segment wide	RTP	Capacity	Planned
MER 5	No projects, facility does not meet concept				
MER 6	Widen to six lanes	Segment wide	SOP	Capacity	Planned
MER 7	No projects, facility does not meet concept				
MER 8	Widen to six lanes	Segment wide	SOP	Capacity	Programmed
MER 9	Widen to six lanes	Segment wide	SOP	Capacity	Programmed
STA 1	No projects, facility does not meet concept				
STA 2	Replace interchange	Fulkerth Road	RTP	Operations	Programmed
	Replace Interchange	Main Street	RTP	Operations	Planned
	Auxiliary Lanes	Taylor Road to Monte Vista	RTP	Capacity	Planned
STA 3	Auxiliary Lanes	Keyes Road to Taylor Road	RTP	Operations	Planned
STA 4	Modify Interchange	Mitchell and Service Roads	SOP	Operations	Programmed
STA 5	Auxiliary Lanes	Hatch Road to Ninth Street	RTP	Operations	Planned
STA 6	Interchange ramp and lanes modification	Beckwith and Carpenter Roads	SOP	Operations	Programmed
STA 7	No projects, facility does not meet concept				
SJ 1	Widening	Throughout	RTP Amendment	Capacity	Programmed
SJ 2	Interchange	Austin Road	SOP	Capacity	Planned
	Widening	Throughout to SR 120 W	RTP Amendment	Capacity	Programmed
	Interchange	SR 120	SOP	Capacity	Programmed
SJ 3	Median Barrier	PM 5.3/5.7	SOP	Safety	Planned
SJ 4-- SJ 9	No projects, facility does not meet concept				
SJ 10	New Interchange	March Lane	SOP	Capacity	Planned
	Interchange	Morada Lane	SOP	Capacity	Programmed
	Interchange	Eight Mile Road	SOP	Capacity	Programmed
	Interchange	Harney Road	SOP	Capacity	Planned
SJ 11	Widen to six lanes	Harney to Kettleman Lane	SOP	Capacity	Planned
SJ 12	Widen to six lanes	Entire Segment	SOP	Capacity	Planned
	On Ramp Modification	Victor Road	SOP	Operations	Programmed
	On Ramp Modification	Turner Road	SOP	Operations	Programmed
SJ 13	Widen to six lanes	Entire Segment	SOP	Capacity	Planned
SJ 14	No projects, facility does not meet concept				

[44] RTP: regional transportation plan; SOP: District 10 Status of Projects

Projects and Strategies to Achieve Concept

Seg.	Description	Location	Source	Purpose	Implementation Phase
All except MER 1	Widen to Eight Lanes With HOV	City of Merced to Sacramento County Line	Caltrans District 10	Capacity, Performance	Long Term
All except for MER 1 and SJ 14	Interregional express bus service or light rail	City of Merced to City of Lodi	Caltrans District 10	Multimodal	Long Term

APPENDIX: GLOSSARY OF TERMS AND ACRONYMS

Glossary of terms

Annual Average Daily Traffic (AADT) -- the total traffic volume on a given highway or segment in a year divided by 365. The year is from October 1st through September 30th. Raw traffic counts are obtained through a sampling program of highway locations throughout the District, rather than continuous sampling throughout the year (though this may not be accurate for PeMS stations that continuous monitor traffic volumes). These counts are adjusted to compensate for daily and seasonal variability compared to previous records.

Base year – the initial year of analysis, usually, the year that recent data is available.

Bikeways:

Class I (Bike Path) – a separate travel right of way for the exclusive use of bicycles, pedestrians, and possibly equestrians.

Class II (Bike Lane) – a lane within a shared right of way for use of bicycles. Usually separated from motorized vehicle traffic by striping, and may permit merging at approached to intersections for right turns.

Class III (Bike Route) – shared right of way between motorized vehicles and bicycles, may have wide shoulders to accommodate separation of the two modes, or may be signed to alert motorists to shared use.

Class IV – a lane within a shared right of way for use of bicycles similar to a Class II. Separated from motorized vehicle traffic by a physical barrier

Bottlenecks – a location where the carrying capacity is substantially less than elsewhere on a route. Often this occurs with a lane reduction, or excessive merging and weaving, or driver distraction, or a surge in demand, or a combination of these and other factors.

California Transportation Plan (CTP) – a statewide, long-range transportation plan with a minimum 20-year planning horizon intending to address both future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve a collective vision for California's future, statewide, integrated, multimodal transportation system. The CTP is prepared in response to federal and State requirements and is updated every five years.

Capacity – the maximum sustainable hourly flow rate at which persons or vehicles reasonably can be expected to traverse a point or a uniform section of a lane or roadway during a given time period under prevailing roadway, environmental, traffic, and control conditions.

Concept LOS – the minimum acceptable LOS over the next 20-25 years.

Conceptual Project – an action or a project that needed to maintain mobility or serve multimodal users, but is not included in a fiscally constrained plan and is not programmed. It could be included in a General Plan or in the unconstrained section of a long-term plan.

Corridor – a broad geographical band that follows a general directional flow connecting major sources of trips that may contain a number of streets, highways, bicycle, pedestrian, and transit route alignments. Off system facilities are included as informational purposes and not analyzed in the TCR.

Facility Concept – describes the future highway facility and the strategies that may be needed to be deployed within the next 20-25 years. This can include capacity increasing, State highway, bicycle facility, pedestrian facility, transit facility, non-capacity increasing operational improvements, new managed lanes, conversion of existing managed lanes to another managed lane type or characteristic, TMS field elements, TDM and incident management.

Demand Management – the application of strategies and policies to reduce travel demand, or to redistribute this demand in space or in time. Essentially it refers to strategies to reduce peak hour congestion.

Facility Type – refers to a highway as being either a freeway, expressway, conventional, or a one-way city street.

Freight Generator – any facility, business, manufacturing plant, distribution center, industrial development, or other location (convergence of commodity and transportation system) that produces significant commodity flow, measured in tonnage, weight, carload, or truck volume.

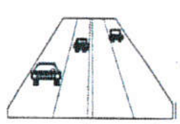
Headway – the time between two successive vehicles as they pass a point on the roadway, measured from the same common feature of both vehicles.

Horizon Year – The year that the future (20-25 years) data is based on.

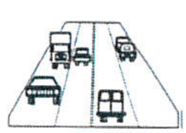
Intermodal Freight Facility – a location where different transportation modes and networks (air, marine, rail, truck) interconnect and allow freight to be transferred (transloaded) from one mode to another.

Intelligent Transportation System (ITS)—an integrated network of communications-based information and electronics technologies to collect real time traffic information, process it, and take appropriate actions. The intended outcomes are to improve transportation safety, mobility and to enhance worker productivity by reducing travel delay.

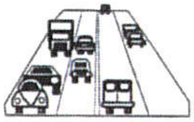
Level of Service (LOS) — a qualitative measure describing operational conditions within a traffic stream and their perception by motorists. A LOS definition generally describes these conditions in terms of speed, travel time, freedom to maneuver, traffic interruption, comfort, and convenience. Six levels of LOS can generally be categorized as follows:



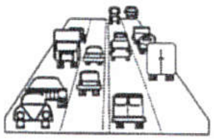
LOS A describes free flowing conditions. The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway.



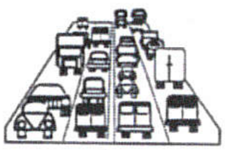
LOS B is also indicative of free-flow conditions. Average travel speeds are the same as in LOS A, but drivers have slightly less freedom to maneuver.



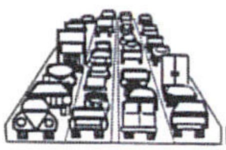
LOS C represents a range in which the influence of traffic density on operations becomes marked. The ability to maneuver with the traffic stream is now clearly affected by the presence of other vehicles.



LOS D demonstrates a range in which the ability to maneuver is severely restricted because of the traffic congestion. Travel speed begins to be reduced as traffic volume increases.



LOS E reflects operations at or near capacity and is quite unstable. Because the limits of the level of service are approached, service disruptions cannot be damped or readily dissipated.



LOS F a stop and go, low speed conditions with little or poor maneuverability. Speed and traffic flow may drop to zero and considerable delays occur. For intersections, LOS F describes operations with delay in excess of 60 seconds per vehicle. This level, considered by most drivers unacceptable often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection.

Multi-modal – the different modes of commuting within a travel corridor (automobile, subway, bus, rail, bicycle, pedestrian, or air).

Park-and-Ride – location where commuters park their personal vehicles and continue their trip by carpool, vanpool, or transit.

Peak Hour – the hour of the day in which the maximum volume occurs across a point on the highway.

Peak Hour Volume – the hourly volume during the highest hour traffic volume of the day traversing a point on a highway segment. It is generally between 6 percent and 10 percent of the ADT. The lower values are generally found on roadways with low volumes.

Peak Period – the part of day during which traffic congestion is at its greatest. Typically, this happens twice a day, in the morning and in the evening during the time most people commute to work or return (rush hour). Peak Period is defined for individual routes, not a District or statewide standard.

Planned Project – a planned improvement or action is a project in a fiscally constrained section of a long-term plan, such as an approved Regional or Metropolitan Transportation Plan (RTP or MTP), Capital Improvement Plan, or measure.

Post Mile – a measured location on a route within the State Highway System. Typically measured on routes from county lines, the values of a post mile will increase from south to north, or west to east. When a section of road is relocated, new post miles (usually noted by an alphabetical prefix such as "R" or "M") are established for it. If relocation results in a change in length, "milepost equations" are introduced at the end of each relocated portion so that mileposts on the reminder of the route within the county will remain unchanged.

Programmed Project – an improvement or action identifying funding amounts by year, and included in short term project funding documents such as the State Transportation Improvement Program (STIP) or the State Highway Operation and Protection Program (SHOPP). Programming refers to projects permitted for expenditure of monies allocated for project development and implementation (are subject to oversight by project managers).

Railroads:

> Class I – a carrier having annual operating revenues of $250 million or more. This class includes the nation's major railroads. In California, Class I railroads include Union Pacific Railroad (UP) and Burlington Northern Santa Fe Railway (BNSF).
>
> Class II – a carrier having annual operating revenues between $250 million and $20 million. Class II railroads are considered mid-sized freight-hauling railroad in terms of operating revenues. They are considered "regional railroads" by the Association of American Railroads.
>
> Class III – a carrier having annual operating revenues of $20 million or less. The typical Class III is a short line railroad, which feeds traffic to or delivers traffic from a Class I or Class II railroad.

Route Designation – refers to design standards applicable to a route based upon legislative intent. Typical legislative designations include National Highway System (NHS), Interregional Route System (IRRS), Freeway and Expressway System, and Scenic Highway System.

Rural – Fewer than 5,000 in population designates a rural area. Limits are based upon population density as determined by the U.S. Census Bureau.

Segment – A portion of a facility between two points.

System Operations and Management Concept – Describe the system operations and management elements that may be needed within 20-25 years. This can include Non-capacity increasing operational improvements (aux. lanes, channelization's, turnouts, etc.), conversion of existing managed lanes to another managed lane type or characteristic (e.g. HOV lane to HOT lane), TMS Field Elements, transportation demand management, and incident management.

System Preservation — the unmet needs estimated for preserving the state's transportation system incorporates three elements: preventive maintenance, rehabilitation and reconstruction, and regulatory mandates.

- Preventive maintenance applies cost-effective treatments to existing transportation infrastructure to help preserve it, slowing down future deterioration and maintaining or improving the functional condition of the infrastructure (without significantly increasing the structural capacity). Preventive maintenance strategies are typically applied to assets that are in good condition and have significant remaining service life. This ensures the structural integrity of transportation systems that serve people and freight.

- Rehabilitation and reconstruction strategies are applied to transportation infrastructure that is in fair to poor condition. The goal here is to restore assets to an acceptable operating condition.

- Preservation efforts also include the cost of regulatory mandates. Examples of regulatory mandates include storm water retrofitting required by the Clean Water Act (CWA) and state water quality control boards, and improvements required by the Americans with Disabilities ACTC (ADA).

TDM - Transportation Demand Management programs designed to reduce or shift demand for transportation through various means, such as the use of public transportation, carpooling, telework, and alternative work hours. TDM strategies can be used to manage congestion during peak periods and mitigate environmental impacts.

Tier I — partially programmed projects

Tier II — fiscally constrained projects that are not programmed. Projects in this category must be from a fiscally constrained document/list (such as the fiscally constrained project list in an RTP) and not from an unconstrained document (such as a TCR).

Tier III — projects that the District will advocate to be included in fiscally constrained projects lists (RTP, SHOPP) during the 20-25 year planning horizon. These are projects that are not currently in a fiscally constrained project list.

Tier IV — projects that have a demonstrated need within the 20-25 year time horizon and have been identified as high priority by the District but are unlikely to receive funding within the 20-25 year time horizon. These are likely projects that will be programmed if an unexpected funding source becomes available, like an initiative or local measure.

Tier V — other projects identified as needed by the District: these may be within the 20-25 year time horizon, beyond the 20-25 year time horizon, or only conceptual in nature.

Transportation Management System (TMS) — the business processes and associated tools, field elements and communications systems that help maximize the productivity of the transportation system. TMS includes, but is not limited to, advanced operational hardware, software, communications systems and infrastructure, for integrated advanced TMS and information systems, and for electronic toll collection systems.

Urban – 5,000 to 49,999 in population designates an urban area. Limits are based upon population density as determined by the U.S. Census Bureau.

Urbanized — over 50,000 in population designates an urbanized area. Limits are based upon population density as determined by the U.S. Census Bureau.

Vehicle Miles Traveled (VMT) — the total number of miles traveled by motor vehicles on a road or highway segments.

Acronyms

AADT - Annual Average Daily Traffic
AB - Assembly Bill
ACE - Altamont Commuter Express
ADA - Americans with Disabilities Act of 1990
APCD - Air Pollution Control District

BART - Bay Area Rapid Transit
BNSF - Burlington Northern Santa Fe
BRT - Bus Rapid Transit
BY - Base Year

CALTRANS - California Department of Transportation
CAPM - Capital Preventive Maintenance
CARB – California Air Resources Board
CCOG - Calaveras County Council of Governments
CCTVs - Closed Circuit Television Cameras
CFR - Code of Federal Regulations
CHP - California Highway Patrol
CMA - Congestion Management Agencies
CMAQ - Congestion Mitigation and Air Quality
CMIA - Corridor Mobility Improvement Account
CMS - Changeable Message Signs
CSMP - Corridor System Management Plan
CSS - Context Sensitive Solutions
CTC - California Transportation Commission
CTP - California Transportation Plan

DOF- Department of Finance
DSMP - District System Management Plan
DWR - Department of Water Resources

EB - Eastbound
EIS - Environmental Impact Statement
EIR - Environmental Impact Report

FHWA - Federal Highway Administration
F&E - Freeway and Expressway

GHG - Green House Gas

HAR - Highway Advisory Radio
HCP - Habitat Conservation Plan
HDM – Highway Design Manual
HFST – Friction Surface Treatment
HOT - High occupancy toll lane
HOV - High occupancy vehicle lane
HPP - High Profile Projects
HSIP - Highway Safety Improvement Program

HSR - High Speed Rail
HY - Horizon Year

ICES - Intermodal Corridor of Economic Significance
IGR - Intergovernmental Review
IIP - Interregional Improvement Program
INVEST – Infrastructure Voluntary Evaluation Sustainability Tool
IOS - Initial Operating Section
IRRS - Interregional Road System
ITS - Intelligent Transportation System
ITIP – Interregional Transportation Improvement Program
ITSP - Interregional Transportation Strategic Plan
ITTS - Interregional Road System

KM - Kilometer
KPRA - Kingpin to Rear Axle

LOS - Level of Service

M-580 - Marine Highway
MAP-21 - Moving Ahead for Progress in the 21^{st} Century
MAX - Modesto Area Express
MCAG - Merced County Association of Governments
MCCA - Modesto City and County Airport
MCLTC - Mariposa County Local Transportation Commission
MCTC - Mariposa County Transportation Commission
MER - Merced
MPO - Metropolitan Planning Organizations
MVP – Maintenance Vehicle Pullouts

N/A - Not available
NHS - National Highway System
NTN – National Truck Network
OWP – Overall Work Program

PA&ED - Project Approval/Environmental Document
PID - Project Initiation Document
PM - Post Mile
PPNO - Planning/Programming Number
PS&E - Plans, Specifications, and Estimates
PSR - Project Study Report

RHNA - Regional Housing Needs Allocation
RIP - Regional Improvement Program
ROW - Right of Way
RP – California Rail Plan
RSTP - Regional Surface Transportation Program
RTIP - Regional Transportation Improvement Program
RTIF-Regional Transportation Impact Fee
RTP - Regional Transportation Plan

RTPA - Regional Transportation Planning Agencies
RWIS - Roadway Weather Information System

SAFETEA - Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2005
SB - Senate Bill
SCS - Sustainable Community Strategies
SHA - State Highway Account
SHOPP - State Highways Operations and Protection Program
SHS - State Highway System
SHSP - Strategic Highway Safety Plan
SJ - San Joaquin
SJCOG - San Joaquin Council of Governments
SJRTD - San Joaquin Regional Transit District
SJVGMAP - San Joaquin Valley Goods Movement Action Plan
SMF - Smart Mobility Framework
SR - State Route
SRA – State Recreation Area
STA - Stanislaus
STANCOG - Stanislaus Council of Governments
STRAHNET - Strategic Highway Network
STAA - Surface Transportation Assistance Act
STIP - State Transportation Improvement Program
STRAIN - Structure Replacement and Improvements Needs

TASAS – Traffic Accident Surveillance and Analysis System
TCR - Transportation Concept Report
TE - Test and Evaluation Project
TEA-21 - Transportation Equity Act for the 21st Century
TERO - Tribal Employment Rights Ordinance
TDM - Traffic Demand Model
TMC - Transportation Management Centers
TMD – Transportation Demand Modal
TMS - Transportation Management System
TSDP - Transportation System Development Program
TSMO - Transportation System Management and Operations

US - United States
UTC - Ultimate Transportation Concept
UP - Union Pacific